BIOLOGICAL ENVIRONMENT

The Biological Environment section is broken into the following subsections:

- Natural Communities
- Wetlands and Other Waters
- Plant Species
- Animal Species
- Threatened & Endangered Species
- Invasive Species

3.17 Natural Communities

This section of the document discusses natural communities of concern. The focus of this section is on biological communities, not individual plant or animal species. This section also includes information on wildlife corridors and habitat fragmentation. Wildlife corridors are areas of habitat used by wildlife for seasonal or daily migration. Habitat fragmentation involves the potential for dividing sensitive habitat and thereby lessening its biological value.

Wetlands and other waters are also discussed below in *Section 3-18*. Habitat areas that have been designated as critical habitat under the Federal Endangered Species Act (FESA) are discussed below in the *Section, 3-21 Threatened and Endangered Species*.

3.17.1 Affected Environment

The following technical reports were completed in support of this section of the document and are incorporated by reference: the *Natural Environment Study (NES) (July 2007)*; *Manchester Avenue/Interstate 5 Interchange Project NES Report (January 2004); and I-5 Lagoons Marine Resource Investigation (June 2006)*.

The biological Study Area for the project extended from I-5/La Jolla Village Drive at the southern end to Vandergrift Boulevard at the northern end, and extended out 152.4 m (500 ft) from the edge of pavement on average. A total of 30 plant communities, with eight occurring in both disturbed and undisturbed condition, were identified within the Study Area. In addition, to the plant communities there were several communities with little or no vegetation including mud flat, salt flat, open water, and unvegetated or other Waters of the US . Subtidal habitats for aquatic species are also discussed in this section. A general description of each community and its occurrence within the Study Area is provided below. Maps of the vegetation communities overlaid on 2003 aerial are provided in *Figures 3-17.1a to 3-17.1m.* Because the four build alternatives are very similar in footprint, the largest permanent impact alternative footprint of the 10+4 with Barrier is the only alternative shown.

Upland Communities

Diegan Coastal Sage Scrub
This vegetation type, once widespread in coastal southern California, occurs in patches from Los Angeles to Baja California. This plant community is composed of a variety of low, soft aromatic shrubs dominated by drought-deciduous species such as California sagebrush (*Artemisia californica*), flat-top buckwheat (*Eriogonum fasciculatum* var. *fasciculatum*), white sage (*Salvia apiana*), and black sage (*Salvia mellifera*). Typically, there are also scattered evergreen shrubs including lemonadeberry (*Rhus integrifolia*), laurel sumac (*Malosma laurina*), and toyon (*Heteromeles arbutifolia*). The understory is diverse and includes a rich variety of annual forbs, and both annual and perennial grasses. Coastal sage scrub (CSS) habitat supports a variety of rare plant and animal species (e.g., coastal California gnatcatcher).

CSS habitat occurs on cut and fill slopes primarily in the southern half of the Study Area around most of the lagoons and rivers. CSS within the Study Area is generally dominated by California sagebrush, flat-topped buckwheat, and California sunflower (*Encelia californica*) with lemonadeberry and laurel sumac shrubs.

The disturbed form of this habitat within the Study Area is comprised of the same dominant species listed above with nonnative annual grasses, and nonnative broadleaf species such as Russian thistle (*Salsola tragus*), acacia (*Acacia* spp.), mustard (*Brassica* spp.), and horseweed (*Conyza canadensis*). Disturbed CSS generally has less overall cover than undisturbed CSS. The additional openings are due to the weedy species in this community.

Baccharis Scrub
Baccharis scrub is a form of sage scrub dominated by coyote brush (*Baccharis pilularis*). This habitat is found in low lying areas, often adjacent to drainages. This community is found adjacent to the drainage north of Genesee Avenue. Disturbed Baccharis scrub is also found along this drainage and is dominated by coyote brush and pampas grass (*Cortaderia* sp.*)* above the channel at the southern end of this drainage.

Maritime Succulent Scrub
This community occurs on dry, south-facing slopes and coastal bluffs from Torrey Pines to El Rosario, Baja California. Maritime succulent scrub is dominated by a combination of coastal sage scrub dominants mixed with succulents and cacti and some endemic species (e.g., Del Mar manzanita). Typical species found in this community include California sagebrush, Shaw's agave (*Agave shawii*), California sunflower, coast barrel cactus (*Ferocactus viridescens*), coastal prickly pear (*Opuntia littoralis*), and coastal cholla (*Cylindropuntia prolifera*).

Maritime succulent scrub occurs primarily on the west side of I-5 near Batiquitos Lagoon. The slopes are dominated by California sagebrush, coastal cholla, coast barrel cactus, fishhook cactus (*Mammillaria dioica*), and California sunflower.

Coastal Bluff Scrub
Coastal bluff scrub is a plant community made up primarily of low, prostrate plants that are wind pruned by sea breezes. Dominant plants in this community are primarily woody and/or succulent. Species commonly found in this community include sea dahlia (*Coreopsis maritima*), live forevers (*Dudleya* spp.), lemonadeberry, and prickly pear. Coastal bluff scrub occurs in a few locations on the slopes adjacent to I-5 north of San Elijo Lagoon.

Southern Maritime Chaparral
This community is dominated by wart-stemmed ceanothus (*Ceanothus verrucosus*) and thick-leaved Eastwood's manzanita (*Arctostaphylos glandulosa* ssp. *crassifolia*). Other species found in this community include: chamise (*Adenostoma fasciculata*), spicebush (*Cneordium dumosum*), summer holly (*Comarostaphylos diversifolia*), sea dahlia (*Coreopsis maritima*), Del Mar sand aster (*Lessingia filaginifolia* var. *filaginifolia*), toyon, Torrey pine (*Pinus torreyana*), Nuttall's scrub oak (*Quercus dumosa*), and laurel sumac. Elements of Diegan CSS may be interspersed within this community. Southern maritime chaparral occurs in small patches within the Study Area. It mostly occurs outside of Caltrans right-of-way. Its distribution within the project limits is patchy, it is found on the northbound and southbound freeway slopes at Del Mar Heights Road, on some areas outside the right-of-way on the southbound slopes south of San Elijo Lagoon, and on some smaller patches on the northbound slopes north of Manchester Avenue along northbound I-5.

Some areas of southern maritime chaparral are disturbed and have large openings that are bare or vegetated with nonnative species. Many of the disturbed areas occur along trails or near development. Nonnative species found in disturbed southern maritime chaparral include African fountain grass (*Pennisetum setaceum*), Australian saltbush (*Atriplex semibaccata*), crystalline iceplant (*Mesembryanthemum* spp.), and ice plant (*Carpobrotus edulis*).

Coastal Sage –Chaparral Scrub
Coastal sage – chaparral scrub is a mixture of the dominant species in coastal sage scrub and chaparral communities. Dominant plant species observed include chamise, coastal sagebrush, lilac (*Ceanothus* spp.), black sage, and poison oak (*Toxicodendron diversilobum*). Coastal sage – chaparral occurs on a slope east of Marine View Avenue and south of Loma Santa Fe exit and east of I-5.

Coast Live Oak Woodland
Coast live oak woodland consists primarily of coast live oak (*Quercus agrifolia*) and Engelmann oak (*Quercus englemannii*) with several associated understory species including poison oak (*Toxicodendron diversilobum*), skunk brush (*Rhus trilobata*), scrub oak, and toyon. The herbaceous layer consists of western ragweed (*Ambrosia psilostachya*), Douglas mugwort (*Artemisia douglasiana*), foxtail chess (*Bromus madritensis* ssp. *rubens*), soft chess (*Bromus hordeaceus*), ripgut grass (*Bromus diandrus*) and slender wild oat (*Avena barbata*).

Coast live oak woodland only occurs on the slopes above Jefferson Street south of Buena Vista Lagoon. The habitat is comprised of coast live oaks with nonnative grasses in the understory.

Native Grassland
Native grassland in southern California is characterized by a moderate cover of native bunchgrasses with native forbs and usually a smaller component of nonnative grasses and broadleaf species. Native grassland in the Study Area is dominated by purple needlegrass (*Nassella pulchra*) with giant wild rye (*Leymus condensatus*) and blue wild rye (*Elymus glaucus*), with nonnative grasses and forbs within the community. Native grassland occurs on both the northbound and southbound slopes of I-5 north of Genesee Avenue.

Nonnative Grassland
Nonnative grassland consists of dense-to-sparse cover of nonnative annual grasses, often associated with species of showy-flowered, native annual forbs, especially in years of high rainfall. This vegetation community is a disturbance-related community most often found in old fields or openings in native scrub habitats that occur on fine-textured, usually clay soils. These soils are moist or even waterlogged during the winter rainy season and very dry during the summer and fall. Typical grasses found within the Study Area include wild oat (*Avena* sp.), soft chess, African fountain grass, veldt grass (*Ehrharta calycina*), red brome, and ripgut grass. Invasive species such as fennel (*Foeniculum vulgare*) and mustard are often associated with this vegetative community as a lesser component. Nonnative grassland occurs in various locations along the cut slopes throughout the corridor. Nonnative grassland is often found where ornamental vegetation has been degraded or grasses such as African fountain grass were planted as ornamental vegetation.

Nonnative Woodland
Nonnative woodland is a community comprised of nonnative trees including Eucalyptus (*Eucalyptus* spp.), pine trees (*Pinus* spp.), pepper trees (*Schinus* spp.), and others. This community is dominated by trees and does not include areas with a few trees interspersed with other herbaceous and shrubby plants. This habitat is generally dominated with Eucalyptus groves along I-5. Nonnative woodland is found on the fringes around the lagoons and in various areas throughout the corridor.

Bare Ground
The bare ground designation is either bare or sparsely vegetated areas with weedy invasive species and a few native shrubs due to disturbance or shading. Many of these areas are utility easement roads and/or hiking trails. Plant species commonly found in these sparse areas include foxtail chess, mustard, slender wild oat, and horseweed.

Disturbed Habitat
These areas are any lands where agricultural practices, construction, or other land-clearing activities have altered the native vegetation; species composition and site conditions are not characteristic of the disturbed phase of one of the plant associations. Such habitat, which is dominated by non-native annuals and perennial broadleaf species, is typically found in vacant lots, roadsides, construction staging areas, and abandoned fields. Typical species found in this community include mustards, filaree (*Erodium* spp.), Russian thistle, tumbleweed (*Amaranthus albus*), sweet fennel, horseweed, crown daisy (*Chysanthemum coronarium*), and often degraded broadleaf ornamental plants such as ice plant, acacia, and myoporum (*Myoporum laetum*).

Agriculture
Agriculture within the Study Area encompasses active and fallow fruit and avocado groves, flower fields, and crop fields. These areas are disturbed and do not usually contain any native vegetation. Some nonnative grassland was associated with fallow agricultural fields in the Study Area.

Ornamental
Ornamental habitat is dominated by nonnative ornamental species. Ornamental species commonly found in this habitat along I-5 include ice plant, acacia, oleander (*Nerium oleander*), bougainvillea (*Bougainvillea* sp.), and scattered nonnative trees. This community is found within Caltrans right-of-way, particularly within interchanges and narrow slopes of the freeway.

Developed
Developed areas are lands that have been permanently altered by human activities. These areas include roads, buildings, and other areas where the land has been altered to such a state that natural vegetation cannot become reestablished. Developed areas occur adjacent to the right-of-way along most of the project alignment.

Wetland Communities

Wetland communities are shown in *Figures 3-17.1a through 3-17.1m*. Army Corps of Engineers (ACOE) jurisdiction wetlands are discussed in *Section 3.18*.

Southern Willow Scrub

This community consists of dense, broadleaf, winter-deciduous riparian thickets dominated by willows (*Salix* spp.) and mulefat (*Baccharis salicifolia*) with scattered emergent cottonwood (*Populus fremonti*) and western sycamore (*Platanus racemosa*). Southern willow scrub occurs along Carmel Creek, the San Luis Rey River, and some of the drainages upstream of the lagoons.

Disturbed southern willow scrub occurs in many of the small drainages and on the edges of larger expanses of habitat within the Study Area. Disturbed southern willow scrub is dominated by willows; however, there are several other weedy species that are also prominent in the habitat. Weedy species often found in disturbed southern willow scrub in the Study Area include giant reed (*Arundo donax*), tamarisk (*Tamarix* spp.), fan palms (*Washingtonia robusta*), castor bean (*Ricinius communis*), cocklebur (*Xanthium strumarium*), and fennel.

Mulefat Scrub

This vegetation type is completely dominated by mulefat, which is a tall (2 to 4 m [6.5 to 13.1 ft]), perennial shrub. Very few other species are associated with this vegetation community. Mulefat scrub is an early successional community following periodic disturbance. Repeated flooding of water channels allows the survival of this habitat type. Mulefat scrub occurs along the perimeter of San Elijo and San Dieguito Lagoons.

Disturbed mulefat scrub occurs in some of the small creeks and drainages and around the edges of larger expanses of undisturbed habitat. Disturbed mulefat scrub is primarily mulefat with weedy species such as Brazilian pepper tree (*Schinus terebinthifolius*), ice plant, eucalyptus, acacia, and castor bean.

Freshwater Marsh

Freshwater marsh is dominated by perennial, emergent monocots at 1.3 to 2 m (4.3 to 6. 6 ft). Uniform stands of bulrushes (*Scirpus* spp.) or cattails (*Typha* spp.) often characterize this habitat. The soil in freshwater marshes is permanently saturated year-round with water and can support a high diversity of native and nonnative plant species. Freshwater marsh is found sporadically throughout the wetlands within the Study Area with the largest expanses in Buena Vista Lagoon.

Disturbed freshwater marshes are areas that have been invaded by nonnative weedy species that have become a prominent portion of the community. Nonnative species found in this habitat include myoporum, eucalyptus, Brazilian pepper tree, and small patches of giant reed. Disturbed freshwater marsh is found primarily in small drainages adjacent to I-5.

Southern Willow Scrub/Freshwater Marsh

Southern willow scrub/freshwater marsh is a mosaic of freshwater marsh species and willows. This habitat is found along Carmel Creek at the western end of the Carmel Valley Restoration Enhancement Project (CVREP).

Southern Arroyo Willow Woodland

Southern arroyo willow woodland is composed of larger willows than southern willow scrub. Arroyo willows (*Salix lasiolepis*) are the dominant species in this community with mulefat, desert wild grape (*Vitus girdiana*), and goldenbush (*Isocoma menzieii*) in the understory. This habitat occurs around the margins of San Elijo Lagoon where there is an influx of fresh water.

Disturbed southern arroyo woodland is found along the western portion of Manchester Avenue at the boundary of San Elijo Lagoon. Nonnative invasive species found in this habitat include ice plant, date palm (*Phoenix dactylifera*), giant reed, and castor bean.

Coastal Brackish Marsh

Coastal brackish marsh is characterized by salt tolerant species such as pickleweed (*Salicornia virginica*), saltgrass (*Distichlis spicata*), alkali heath (*Frankenia salina*), and freshwater species such as cattail and bulrushes. Many species depend on this community for nesting and foraging habitat. This community occurs at the Los Peñasquitos, San Dieguito, San Elijo, Batiquitos, and Buena Vista Lagoons as well as Encinas Creek.

Disturbed coastal brackish marsh is found around the margins of the lagoons where the marsh has been disturbed by human activities or natural phenomenon. Nonnative species found in disturbed coastal brackish marsh include myoporum, Brazilian pepper tree, ice plant, and acacia.

Southern Coastal Salt Marsh

These areas are typically flooded during high tides or strong winter storms. Most plants in this community are low-growing, salt-tolerant succulents called halophytes. Among the common dominant species are pickleweed, alkali heath, and saltgrass, with cordgrass (*Spartina foliosa*), salty susan (*Jaumea carnosa*), and estuary sea-blite (*Suaeda esteroa*). Coastal salt marsh vegetation is very important for wildlife. Several rare and endangered species of birds (e.g., light-footed clapper rail [*Rallus longirostris levipes*], Belding's savannah sparrow [*Passerculus sandwichensis beldingi*]) and plants are dependent upon it for survival. The remaining areas of this community represent only a small remnant of what originally existed in San Diego County. Coastal salt marsh is found in and around the coastal lagoons including Los Peñasquitos, San Dieguito, San Elijo, Batiquitos, and Agua Hedionda.

Disturbed salt marsh/brackish marsh is present along the eastern right-of-way edge at the toe of fill slope in the San Dieguito River Valley and along the margins of salt marsh habitat in the other lagoons. The disturbed salt marsh, north of Del Mar Heights Rd., is found along the drainage ditch at the toe of the slope and is interspersed with weedy species and some more brackish water species. Disturbed salt marsh/brackish marsh onsite is dominated by alkali heath, pickleweed, bull tule (*Scirpus robustus*), saltgrass, tamarisk, and cocklebur (*Xanthium strumarium* var. *canadense*). This habitat occurs at the edge of the right-of-way where erosion from drainage structures has washed sediment down the slope.

Salt Marsh Transition

Although salt marsh transition community is not described in the literature, there is no community type that fits those areas between the southern coastal salt marsh and coastal sage scrub communities where there is no tidal influence, but plants are salt tolerant. Salt marsh transition along I-5 is dominated by a combination of species including pickleweed, goldenbush, four-wing saltbush (*Atriplex canescens)*, alkali heath, and coyote bush (*Baccharis pilularis*). Vegetation in this community is often sparsely distributed with salt pan areas in between plants. Salt marsh transition is found primarily around San Dieguito and Batiquitos Lagoon where the land begins to slope up away from the lagoon.

Arundo Scrub
Arundo scrub is a monotypic stand of giant reed. Giant reed is an invasive weed that grows in large thickets. Arundo scrub is found in scattered clumps along the I-5 and occurs in extensive stands at Buena Vista Lagoon and the San Luis Rey River.

Drainage Ditch
Drainage ditch habitat has small patches of distributed freshwater marsh and weedy species found in either lined or earthen drainage ditches along I-5. These are all human-made ditches, some of which are jurisdictional wetlands and some just convey runoff to storm drains. The drainage ditches are primarily unvegetated with patches of cattails, sedges, rushes, or weedy species such as castor bean and cocklebur.

Disturbed Wetland
Disturbed wetlands are communities that exhibit hydrology, soils, and vegetation; however, the species found onsite are a combination of weedy, nonnative and native species that do not resemble the other wetland habitats. Species commonly found in disturbed wetlands along the I-5 include fan palm (*Washingtonia robusta*), water cress (*Rorripa nasturtium-aquaticum*), willow herb (*Epilobium* spp.), curly dock (*Rumex crispus*), evening primrose (*Oenothera elata hookeri*), and sedges. Disturbed wetland is found in several drainages parallel to I-5 including the east side of I-5 south of the San Dieguito River, east of I-5 and north of Santa Fe, east of I-5 south of Palomar Airport Road, and at Loma Alta Creek.

Mud Flat
Mud flat habitat is unvegetated and occurs in the low to mid intertidal areas around each of the tidal lagoons. Although mudflat is unvegetated it is important habitat for many invertebrates and is foraging habitat for many shorebirds.

Salt Flat
Salt flat is similar to mud flat habitat in that it is primarily unvegetated; however this habitat is found usually at or above the high tide level. Salt flats or pannes form a hard crust that does not allow plants to grow. These areas can provide habitat for ground nesting birds such as California least terns, western snowy plovers, and killdeer.

Open Water
Open water habitat is deeper water that is unvegetated or may have subtidal vegetation such as eelgrass. Open water habitat is considered jurisdictional waters of the U.S., but is not considered a wetland because it does not support a plant community. Eelgrass beds, if present, are considered special aquatic sites. Open water habitat is important foraging and resting areas for many bird species and also provides important fish and invertebrate habitat. Open water can be found in all the coastal lagoons and in the larger rivers flowing under I-5.

Subtidal communities
Subtidal communities are generally a subset of open water communities in the lagoons. Eelgrass beds grow subtidally and are important habitats for aquatic species and have specific regulations concerning impacts and mitigation. Subtidal portions of the lagoons within the Study Area were surveyed in 2006 for current eelgrass and possible toxic algae (*Caulerpa taxifolia*) distributions for purposes of identifying potential impacts. However, due to the variability in eelgrass distributions pre-construction/post-construction surveys are required by the regulatory agencies to make the final determination of impact to eelgrass. Pre and post construction surveys and construction monitoring would likely be required in the lagoons to monitor for toxic algae.

San Dieguito Lagoon
San Dieguito Lagoon was thoroughly studied for the large restoration project that began in late 2006. No eelgrass was found during these studies, and none is expected to occur in the future due to lack of tidal flushing and scour in the main channel of the San Dieguito River.

San Elijo Lagoon
At present, no eelgrass occurs within the San Elijo Lagoon I-5 Study Area. Salinities within the sampling area of San Elijo Lagoon are currently, and typically, well below the range suitable to support eelgrass. If future restoration efforts are implemented, circulation and bathymetry may be altered such that the sampling area could support eelgrass. However, at the present time, the conditions at the site are not expected to support eelgrass.

Batiquitos Lagoon
Eelgrass was mapped within the Batiquitos Lagoon sampling area in April 2006 (*Figure 3-17.2*). To the west of the I-5 bridge, extensive eelgrass occurred on the north shore of the lagoon, with a more narrow fringing bed occurring on the south shore. To the east of the bridge, a small bed occurred immediately north of the bridge, but did not extend farther north due to the elevation of that area. The eelgrass mapped on the southern shore was the western edge of a continuous bed that extended 1.5 km (0.9 mi) farther east in the lagoon. The eelgrass appeared healthy, of tall stature, and generally free from epiphytes. The mean leaf shoot density in the eelgrass beds was 368 + 101 shoots/m^2. Eelgrass does not grow in the channel leading up to, under, or past the bridge due to depth and high current velocities. However, eelgrass beds fringing the shoals surrounding the deeper channels are extremely dense compared to beds found in most systems of southern California. This high density is believed to be related to higher current velocities and ideal light environments.

The distribution of eelgrass mapped during the April 2006 survey is typical of this area of Batiquitos Lagoon, although in prior years eelgrass has been more extensive to the west of the bridge in the central basin (Eelgrass distribution patterns within Batiquitos Lagoon are influenced by a number of factors, including maintenance dredging near the lagoon mouth; sedimentation in the lagoon; and variable fluvial and oceanic influences including storm-derived sediments and turbidity, nutrient influx, and red tide). In addition, eelgrass within Batiquitos Lagoon was introduced through habitat restoration in October 1997.

During the course of the eelgrass surveys, no occurrences of the non-native, invasive seaweed *Caulerpa taxifolia* were detected within the sampling area. There is no record of this seaweed occurring at Batiquitos Lagoon in the past, although the lagoon is considered to be “at-risk” due to its proximity to residential areas, the input of storm drains, and the presence of eelgrass.

Agua Hedionda Lagoon
Eelgrass was detected within the Agua Hedionda Lagoon sampling area in May 2006 (*Figure 3-17.2*). The eelgrass was primarily restricted to fringing shoreline beds along the shore of both the east and central basin of the lagoon. The eelgrass appeared healthy, of moderate stature, and generally free from epiphytes. The mean leaf shoot density in the eelgrass beds was 243 + 103 shoots/m^2.

The present distribution of eelgrass covered approximately 10 percent of the area that has been known to support eelgrass during surveys conducted in recent years. In September 2003, the area investigated in the present survey supported a total of 3.36 ha (8.31 ac) of eelgrass. There was a large-scale dieback of eelgrass that occurred in 2005 in Agua Hedionda Lagoon, and the eelgrass has not yet recovered to the distribution of prior years. Therefore, it should be assumed that the present distribution of eelgrass is considerably more restricted than it would likely be in coming years.

A large infestation of the non-native, invasive seaweed *Caulerpa taxifolia* was discovered growing in Agua Hedionda Lagoon in 2000. A portion of the infestation occurred within the sampling area of the present study. Successful eradication efforts have been under way since 2000 and *C. taxifolia* is now eradicated from Agua Hedionda Lagoon (M&A 2006b).

Buena Vista Lagoon
Buena Vista Lagoon is currently freshwater on both sides of I-5 with no eelgrass habitat present. Toxic algae is not anticipated in this habitat.

Wildlife Corridors
Wildlife corridors connect large patches of natural open space that allow for the immigration and emigration of wildlife. Such movement assures the continual sharing of genetic information that helps maintain genetic diversity and reduces the probability of extinction through random events. Animals such as mule deer (*Odocoileus hemionus*), coyotes (*Canis latrans*), and mountain lions (*Felis concolor*) require large expanses of land. For these species, corridors provide a link between habitat patches increasing the area available for dispersal, foraging, and breeding. For smaller animals, the corridor itself may provide the habitat needed to sustain viable populations.

Within the Study Area, the lagoons and habitats surrounding the lagoons are considered important linkages for wildlife movement. In addition to the lagoons, the San Luis Rey River is also a major wildlife corridor. The Multiple Species Conservation Program (MSCP) names Los Peñasquitos Lagoon and San Dieguito Lagoon as key Biological Core and Linkage Areas and they are identified in regional conservation plans as either preserved or an area targeted for conservation. I-5 itself is a barrier to wildlife movement. However, the existing bridges over the lagoons do provide limited crossings on the abutments. During I-5 surveys, mule deer and their sign were primarily observed west of I-5 near Genesee, in Los Peñasquitos Creek under I-5, and along Carmel Creek leading to Los Peñasquitos Lagoon. Coyote scat was observed near all lagoons and in coastal sage scrub throughout the corridor. Although no mountain lion or bobcat scat or tracks were observed, they are known to occur in habitats around the lagoons. Small mammal tracks were observed on the bridge abutments at each of the lagoons and at the San Luis Rey River Bridge.

Small mammal signs have been observed at some of the larger culverts that cross under the freeway. Due to the current width of I-5, only larger culverts are used with any frequency. Large culverts at Encina Creek, and north of Manchester are used by small mammals to cross under the freeway. Development on either side of I-5 between the lagoons limits wildlife use in these areas.

3.17.2 Environmental Consequences

The 8+4 and 10+4 with Barrier alternatives have larger footprints than the buffer alternatives. In general, the 8+4 with buffer paved area is 69 m (226.3 ft) wide, 10+4 with buffer is 76.2 m (250 ft) wide, 8+4 with Barrier is 77.4 m (253.9 ft) wide and the 10+4 with Barrier is 83.4 m (273.6 ft) wide. The impacts to all habitats associated with the four alternatives are described below.

Permanent impacts to biological resources for each of the build alternatives were determined to be those within the boundary of the cut and fill slopes, retaining walls, and/or paved areas. Although the cut and fill slopes would be revegetated, the length of time for construction and large areas to be graded were determined to qualify as a permanent impact to biological resources. The majority of the bridges within the project would be replaced. Permanent impacts due to the bridge columns are not available at this time; therefore, the entire new structure was used as a conservative estimate. Temporary construction impacts were identified as those areas of impact outside of the permanent impact areas required for equipment access and staging to complete construction.

Proposed impacts to natural communities are separated into upland and wetland habitats. All four build alternatives impact the same types of habitats with incremental differences in total impacts depending on the alternative. Areas of impact were calculated in acres and converted to hectares and then both rounded to the nearest hundredth.

Wildlife Corridors
I-5 currently acts as a wildlife barrier to east-west movement. Each of the lagoons, rivers, and creeks and the surrounding upland habitat are potential corridors for wildlife to cross from east to west. Widening the freeway would not necessarily cut off these corridors; however, they may make existing crossings less attractive for use by wildlife. Studies have found that wildlife, especially large mammals, use wildlife crossings/corridors that are wider as the length of travel increases. Most of the existing lagoon bridges have steep, narrow abutments that are used by wildlife. The new bridges at the lagoons are being designed with a bench at the abutment to facilitate wildlife movement as well as use by hikers. Although wildlife avoid people, the wildlife would generally be using the trails under the bridges at night and the hikers would generally be using the trails during the day. Corridors at locations where bridges would not be replaced, San Dieguito and San Luis Rey should not be further constrained due to large areas for movement and minimal increases to bridge width. The incremental change in the width of the bridges of the four build alternatives would have an incremental effect to wildlife using these bridges for crossings.

10+4 with Barrier
The proposed impacts to upland communities less than 20 percent is sensitive habitat or habitat used for nesting and foraging by sensitive species. Agriculture, bare ground, developed, disturbed habitat, and ornamental habitats have all been altered to a great extent by human activities so that they provide low quality wildlife habitat. Nonnative woodland is a low-medium quality habitat, but can be used by raptors, songbirds, and other species for nesting and foraging.

The I-5 northbound fill slope between Del Mar Heights Road and the San Dieguito River was impacted in 2001 during construction of an auxiliary lane. Impacts to the CSS on the slope were mitigated offsite, and permits and the consultation for this project were granted with the agreement that the slope would be temporarily revegetated with coastal sage scrub until the final *I-5 NCC Project* construction was completed. After construction of the *I-5 NCC Project*, this slope would be permanently revegetated with CSS; therefore, this slope has been already mitigated (*Table 3.17-1*).

Wetland habitat impacts associated with each of the alternatives include impacts at the six lagoons, as well as the San Luis Rey River, Loma Alta Creek, Encina Creek, Cottonwood Creek, and numerous small lined and unlined drainage ditches that run parallel to I-5 *(Figure 3-17.1* through *3-17.13*). All drainage ditches, arundo scrub, and salt marsh transition habitats are included in the wetland habitats of the State. Impacts to ACOE jurisdictional habitat are discussed in the next section. The majority of the impacts to wetland habitats are associated with widening at the lagoons.

The 10+4 with Barrier alternative has the largest permanent impact footprint of the four build alternatives. Therefore, it has the most impacts to sensitive upland and wetland habitats. The 10+4 with Barrier alternative would permanently impact sensitive upland habitats including 0.26 ha (0.64 ac) Baccharis scrub, 2.27 ha (5.62 ac) of disturbed Baccharis scrub, 5.44 ha (13.43 ac) of CSS, 24.64 ha (60.87 ac) of disturbed CSS, 0.15 ha (0.36 ac) of maritime succulent scrub, 15.81 ha (39.04 ac) of nonnative grassland, 0.73 ha (1.80 ac) of southern maritime chaparral, and 0.19 ha (0.47 ac) of disturbed southern maritime chaparral habitat (*Table 3.17.1* and *Figures 3.17.1a through 3-17.1m*). The majority of the sensitive habitat impacted is nonnative grassland and disturbed coastal sage scrub on the cut slopes of I-5.

Permanent impacts proposed for the 10+4 with Barrier alternative in wetland habitats at the lagoons would be 2.67 ha (6.58 ac) of southern coastal salt marsh, 0.40 ha (0.99 ac) of coastal brackish marsh, 1.29 ha (3.18 ac) of disturbed coastal brackish marsh, 0.98 ha (2.42 ac) of mud flat, and 2.67 ha (6.58 ac) of open water (*Table 3.17.1*). The 10+4 with Barrier alternative would permanently impact a total of 13.10 ha (32.35 ac) of wetland habitats (*Table 3.17.1*).

Temporary construction impacts to sensitive upland communities would be 0.04 ha (0.1 ac) Baccharis scrub, 0.07 ha (0.18 ac) of disturbed Baccharis scrub, 1.22 ha (3.02 ac) of CSS, 4.68 ha (11.55 ac) of disturbed CSS, 0.29 ha (0.72 ac) of maritime succulent scrub, 0.02 ha (0.05 ac) native grassland, 5.16 ha (12.75 ac) of nonnative grassland, 0.12 ha (0.29 ac) of southern maritime chaparral, and 0.75 ha (1.86 ac) of disturbed southern maritime chaparral habitat (*Table 3.17-2*). Temporary impacts proposed for the 10+4 with Barrier include 1.47 ha (3.64 ac) of open water and 1.37 ha (3.37 ac) of southern coastal salt marsh (*Table 3.17.2*).

Eelgrass is considered a special aquatic site and is found in the open water areas of Batiquitos and Agua Hedionda Lagoon. The values in *Table 3.17.3* and *Figure 3-17.2* represent the eelgrass identified during surveys completed in 2006 and provide an indication to the relative amounts of eelgrass that are likely to be encountered during construction. Permanent impacts to eelgrass resulting from the 10+4 with Barrier alternative would be approximately 0.10 ha (0.24 ac) at Batiquitos and Agua Hedionda Lagoons (*Figure 3-17.2*). Approximately 0.10 ha (0.26 ac) of eelgrass would be temporarily impacted by the 10+4 with Barrier alternative (*Table 3.17.3*).

10+4 with Buffer

The 10+4 with Buffer alternative would permanently impact several sensitive upland habitats including 0.26 ha (0.64 ac) Baccharis scrub, 2.27 ha (5.62 ac) of disturbed Baccharis scrub, 5.31 ha (13.11 ac) of CSS, 24.13 ha (59.61 ac) of disturbed CSS, 0.08 ha (0.19 ac) of maritime succulent scrub, 15.52 ha (38.33 ac) of nonnative grassland, 0.63 ha (1.55 ac) of southern maritime chaparral, and 0.20 ha (0.50 ac) of disturbed southern maritime chaparral habitat (*Table 3.17.1* and *Figures 3-17.1a through 3-17.1m*). The majority of the sensitive habitat impacted is nonnative grassland and disturbed coastal sage scrub on the cut slopes of I-5 in the southern half of the project.

Permanent impacts to 1.65 ha (4.07 ac) of southern coastal salt marsh, 0.35 ha (0.86 ac) of coastal brackish marsh, 1.15 ha (2.85 ac) of coastal brackish marsh (disturbed), 0.87 ha (2.16 ac) of mud flat, and 2.04 ha (5.04 ac) of open water would be primarily related to construction at the lagoons (*Table 3.17.1*). The 10+4 with Buffer alternative would permanently impact a total of 10.8 ha (26.67 ac) of wetland habitats (*Table 3.17.1*).

Temporary construction impacts to sensitive upland communities would be 0.04 ha (0.1 ac) Baccharis scrub, 0.07 ha (0.18 ac) of disturbed Baccharis scrub, 1.33 ha (3.28 ac) of CSS, 5.10 ha (12.59 ac) of disturbed CSS, 0.36 ha (0.89 ac) of maritime succulent scrub, 0.02 ha (0.05 ac) native grassland, 5.41 ha (13.37 ac) of nonnative grassland, 0.19 ha (0.46 ac) of southern maritime chaparral, and 0.74 ha (1.83 ac) of disturbed southern maritime chaparral habitat (*Table 3.17.2*).

The majority of the temporary impacts to wetlands would occur at the lagoons. Temporary impacts to open water 1.46 ha (3.60 ac) and southern coastal salt marsh 2.35 ha (5.79 ac) would be the largest temporary wetland impacts (*Table 3.17.2*).

Permanent impacts to eelgrass resulting from the 10+4 with Buffer alternative would be approximately 0.06 ha (0.15 ac) at Batiquitos and Agua Hedionda Lagoons (*Table 3.17.3*). Approximately 0.1 ha (0.26 ac) of eelgrass would be temporarily impacted by the 10+4 with buffer.

8+4 with Barrier

The 8+4 with Barrier alternative would permanently impact several sensitive upland habitats including 0.26 ha (0.64 ac) Baccharis scrub, 2.27 ha (5.62 ac) of disturbed Baccharis scrub, 5.39 ha (13.31 ac) of CSS, 24.21 ha (59.80 ac) of disturbed CSS, 0.13 ha (0.32 ac) of maritime succulent scrub, 15.88 ha (39.22 ac) of nonnative grassland, 0.71 ha (1.75 ac) of southern maritime chaparral, and 0.19 ha (0.46 ac) of disturbed southern maritime chaparral habitat (*Table 3.17.1* and *Figures 3-17.1a through 3-17.1m*). The majority of the sensitive habitat impacted is nonnative grassland and disturbed coastal sage scrub on the cut slopes of I-5 in the southern half of the project.

The I-5 northbound fill slope between Del Mar Heights Road and the San Dieguito River was impacted in 2001 during construction of an auxiliary lane. Impacts to the CSS on the slope were mitigated offsite, and permits and the consultation for this project were granted with the agreement that the slope would be temporarily revegetated with coastal sage scrub until the final *I-5 NCC Project* construction was completed. After construction of the I-5 North Coast Project, this slope would be permanently revegetated with CSS; therefore, this slope has been already mitigated (*Table 3.17.1*).

Wetland habitat impacts associated with each of the alternatives include impacts at the six lagoons, as well as the San Luis Rey River, Loma Alta Creek, Encina Creek, Cottonwood Creek, and numerous small lined and unlined drainage ditches that run parallel to I-5 (*Figures 3-17.1a through 3-17.1m*). All drainage ditches, arundo scrub, and salt marsh transition habitats are included in the wetland habitats of the State. Impacts to ACOE jurisdictional habitat are discussed in the next section. The majority of the impacts to wetland habitats are associated with widening at the lagoons.

Permanent impacts proposed for the 8+4 with Barrier alternative in wetland habitats at the lagoons would consist of 2.14 ha (5.30 ac) of southern coastal salt marsh, 0.39 ha (0.96 ac) of coastal brackish marsh, 0.90 ha (2.23 ac) of coastal brackish marsh (disturbed), 0.93 ha (2.29 ac) of mud flat, and 2.37 ha (5.86 ac) of open water (*Table 3.17.1*). The 8+4 with Buffer alternative would permanently impact a total of 11.58 ha (28.61 ac) of wetland habitats (*Table 3.17.1*).

Temporary construction impacts to sensitive upland communities would consist of 0.04 ha (0.1 ac) Baccharis scrub, 0.07 ha (0.18 ac) of disturbed Baccharis scrub, 1.27 ha (3.14 ac) of CSS, 5.08 ha (12.55 ac) of disturbed CSS, 0.31 ha (0.77 ac) of maritime succulent scrub, 0.02 ha (0.05 ac) native grassland, 5.03 ha (12.43 ac) of nonnative grassland, 0.17 ha (0.41 ac) of southern maritime chaparral, and 0.76 ha (1.88 ac) of disturbed southern maritime chaparral habitat (*Table 3.17.2*).

Temporary impacts proposed for the 8+4 with Barrier alternative that are greater than one ha include 1.08 ha (2.68 ac) of disturbed coastal brackish marsh, 1.44 ha (3.56 ac) of open water, and 1.87 ha (4.63 ac) of southern coastal salt marsh (*Table 3.17.2*).

Permanent impacts to eelgrass resulting from the 8+4 with Barrier alternative would be approximately 0.09 ha (0.23 ac) at Batiquitos and Agua Hedionda Lagoons (*Figure 3-17.2*). Approximately 0.10 ha (0.24 ac) of eelgrass would be temporarily impacted by the 8+4 with Barrier alternative (*Table 3.17.3*).

8+4 with Buffer

The 8+4 with Buffer alternative has the fewest permanent impacts of the four build alternatives. The majority of the sensitive upland communities occur around the lagoons and on the slopes of I-5 south of Birmingham Drive. Based on permanent impact footprint the 8+4 with Buffer alternative would permanently impact several sensitive upland habitats including 0.26 ha (0.64 ac) Baccharis scrub, 2.27 ha (5.62 ac) of disturbed Baccharis scrub, 5.14 ha (12.70 ac) of CSS, 22.99 ha (56.79 ac) of disturbed CSS, 0.08 ha (0.19 ac) of maritime succulent scrub, 13.02 ha (32.17 ac) of nonnative grassland, 0.64 ha (1.57 ac) of southern maritime chaparral, and 0.13 ha (0.33 ac) of disturbed southern maritime chaparral habitat (*Table 3.17.1* and *Figures 3-17.1a through 3-17.1m*).

Impacts to southern coastal salt marsh, coastal brackish marsh, coastal brackish marsh (disturbed), mud flat, and open water are primarily related to impacts at the lagoons (*Table 3.17.1*). The 8+4 with Buffer alternative would impact a total of 9.88 ha (24.41 ac) (*Table 3.17.1*).

The temporary impact areas are based on general access needs and right-of-way available. The final construction access areas would be refined as the construction details are known. Temporary construction impacts to sensitive upland communities would be 0.04 ha (0.1 ac) Baccharis scrub, 0.07 ha (0.18 ac) of disturbed Baccharis scrub, 1.2 ha (2.96 ac) of CSS, 5.95 ha (14.7 ac) of disturbed CSS, 0.13 ha (0.32 ac) of maritime succulent scrub, 0.02 ha (0.05 ac) native grassland, 7.57 ha (18.7 ac) of nonnative grassland, 0.17 ha (0.43 ac) of southern maritime chaparral, and 0.81 ha (2.00 ac) of disturbed southern maritime chaparral habitat (*Table 3.17.2*).

Temporary impacts to wetland communities would result from access through wetlands to build new bridges, for work platforms, and demolition of old bridges. The majority of the temporary impacts to wetlands would occur at the lagoons. Temporary impacts to open water 1.53 ha (3.77 ac) and southern coastal salt marsh 1.43 ha (3.53 ac) would be the largest temporary wetland impacts (*Table 3.17.2*).

There is more open water and less fringing marsh near the I-5 in Agua Hedionda and, therefore, there is more eelgrass likely to be impacted. There would be approximately 0.04 ha (0.1 ac) of eelgrass permanently impacted by the 8+4 buffer. Approximately 0.1 ha (0.25 ac) of eelgrass would be temporarily impacted by the 8+4 with buffer.

No Build

There would be no impacts to sensitive upland habitats, wetlands, or eelgrass from the No Build Alternative. The No Build Alternative would not change any of the existing structures; therefore, there would be no change the current wildlife corridors. However, there would be no change in the abutment configuration and wildlife would continue to have to move along the narrow, steep abutments to cross under I-5 at the lagoons.

Table 3.17.1: Permanent Impacts to Habitats for the Four Build Alternatives

	10+4 w/ Barrier		10+4 w/ Buffer		8+4 w/ Barrier		8+4 w/ Buffer	
	Ha	Ac	Ha	Ac	Ha	Ac	Ha	Ac
Upland Communities								
Agriculture	7.57	18.71	7.37	18.21	7.35	18.16	7.33	18.12
Baccharis scrub	0.26	0.64	0.26	0.64	0.26	0.64	0.26	0.64
Baccharis scrub(D)	2.27	5.62	2.27	5.62	2.27	5.62	2.27	5.62
Bare Ground	2.26	5.58	2.22	5.48	2.31	5.72	1.78	4.39
CSS	5.44	13.43	5.31	13.11	5.39	13.31	5.14	12.70
CSS(D)	24.64	60.87	24.13	59.61	24.21	59.80	22.99	56.79
CSS(D) Already mitigated[2]	5.51	13.60	2.80	6.92	4.13	10.20	2.66	6.56
Developed	316.31	781.29	312.58	772.08	316.18	780.97	310.88	767.88
Disturbed Habitat	35.59	87.91	33.96	83.87	35.08	86.64	33.03	81.58
Maritime Succulent Scrub	0.15	0.36	0.08	0.19	0.13	0.32	0.08	0.19
Native grassland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nonnative grassland	15.81	39.04	15.52	38.33	15.88	39.22	13.02	32.17
Nonnative Woodland	7.28	17.99	6.82	16.84	7.13	17.61	6.73	16.61
Ornamental	102.18	252.39	100.84	249.07	102.28	252.64	95.86	236.78
So. Maritime Chaparral	0.73	1.80	0.63	1.55	0.71	1.75	0.64	1.57
So. Maritime Chaparral (D)	0.19	0.47	0.20	0.50	0.19	0.46	0.13	0.33
Wetland Communities								
Arundo Scrub	0.09	0.22	0.09	0.23	0.09	0.21	0.09	0.23
Coastal Brackish Marsh	0.40	0.99	0.35	0.86	0.39	0.96	0.35	0.85
Coastal Brackish Marsh (D)	1.29	3.18	1.15	2.85	0.90	2.23	1.08	2.66
Drainage Ditch	0.60	1.49	0.55	1.36	0.55	1.36	0.52	1.30
Disturbed Wetland	0.86	2.13	0.71	1.76	0.74	1.82	0.69	1.70
Freshwater Marsh	0.50	1.22	0.34	0.85	0.38	0.93	0.30	0.74
Freshwater Marsh (D)	0.57	1.41	0.52	1.28	0.52	1.28	0.52	1.28
Mud Flat	0.98	2.42	0.87	2.16	0.93	2.29	0.75	1.85
Mulefat Scrub	0.09	0.23	0.09	0.23	0.09	0.23	0.09	0.23
Open Water	2.38	5.87	2.04	5.04	2.37	5.86	1.70	4.21
Salt Flat	0.01	0.02	0.01	0.02	0.01	0.02	0.01	0.02
So. Coastal Salt Marsh	2.67	6.58	1.65	4.07	2.14	5.30	1.39	3.43
Salt Marsh Transition	0.18	0.44	0.14	0.35	0.17	0.42	0.12	0.29
Southern Willow Scrub	0.07	0.18	0.06	0.14	0.07	0.17	0.05	0.12
Southern Willow Scrub (D)	0.99	2.46	0.93	2.30	0.95	2.35	0.94	2.33
So. willow scrub/FWM	0.44	1.08	0.44	1.08	0.44	1.08	0.44	1.08
Other Waters of the US	0.38	0.94	0.38	0.93	0.38	0.93	0.38	0.93
Open Water under existing Bridge1	0.61	1.50	0.47	1.16	0.47	1.16	0.47	1.16

Impacts were calculated in ac and converted and rounded off to ha.
(D) = Disturbed, So. = Southern, Chap = Chaparral. FWM = Freshwater Marsh
1. Open Water already shaded and impacted with columns of the existing freeway bridge
2. CSS already mitigated by the Del Mar Auxiliary Lane Project
* Sensitive upland habitats

Table 3.17.2: Temporary Impacts to Habitats for the Four Build Alternatives

	10+4 w/ Barrier		10+4 w/ Buffer		8+4 w/ Barrier		8+4 w/ Buffer	
Upland Communities	**Ha**	**Ac**	**Ha**	**Ac**	**Ha**	**Ac**	**Ha**	**Ac**
Agriculture	1.83	4.52	1.83	4.53	1.88	4.64	1.92	4.74
Baccharis scrub	0.04	0.10	0.04	0.10	0.04	0.10	0.04	0.10
Baccharis scrub(D)	0.07	0.18	0.07	0.18	0.07	0.18	0.07	0.18
Bare Ground	0.69	1.70	0.72	1.78	1.02	2.52	0.97	2.40
CSS	1.22	3.02	1.33	3.28	1.27	3.14	1.20	2.96
CSS(D)	4.68	11.55	5.10	12.59	5.08	12.55	5.95	14.70
CSS(D) Already mitigated[2]	0.60	1.48	2.09	5.16	1.30	3.22	2.23	5.50
Developed	40.84	100.87	39.74	98.16	41.41	102.28	39.78	98.27
Disturbed Habitat	9.95	24.57	11.54	28.50	11.07	27.34	12.34	30.47
Maritime Succulent Scrub	0.29	0.72	0.36	0.89	0.31	0.77	0.13	0.32
Native grassland	0.02	0.05	0.02	0.05	0.02	0.05	0.02	0.05
Nonnative grassland	5.16	12.75	5.41	13.37	5.03	12.43	7.57	18.70
Nonnative Woodland	1.48	3.65	1.84	4.54	1.59	3.92	1.93	4.76
Ornamental	27.19	67.15	27.90	68.92	27.05	66.82	31.83	78.63
So. Maritime Chaparral	0.12	0.29	0.19	0.46	0.17	0.41	0.17	0.43
So. Maritime Chap (D)	0.75	1.86	0.74	1.83	0.76	1.88	0.81	2.00

Temporary Impacts to Habitats for the Four Build Alternatives (continued)								
	10+4 w/ Barrier		10+4 w/ Buffer		8+4 w/ Barrier		8+4 w/ Buffer	
Wetland Communities	**Ha**	**Ac**	**Ha**	**Ac**	**Ha**	**Ac**	**Ha**	**Ac**
Arundo Scrub	0.15	0.37	0.14	0.36	0.14	0.35	0.14	0.36
Coastal Brackish Marsh	0.45	1.11	0.50	1.23	0.46	1.14	0.41	1.02
Coastal Brackish Marsh (D)	0.62	1.53	0.73	1.82	1.08	2.68	0.81	2.00
Drainage Ditch	0.22	0.54	0.27	0.67	0.30	0.75	0.30	0.73
Disturbed Wetland	0.25	0.62	0.31	0.77	0.39	0.95	0.31	0.77
Freshwater Marsh	0.85	2.11	0.90	2.23	0.87	2.14	0.70	1.73
Freshwater Marsh (D)	0.29	0.71	0.24	0.60	0.24	0.60	0.22	0.54
Mud Flat	0.10	0.26	0.18	0.45	0.15	0.38	0.20	0.50
Mulefat Scrub	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water	1.47	3.64	1.46	3.60	1.44	3.56	1.53	3.77
Salt Flat	0.04	0.10	0.04	0.10	0.04	0.10	0.00	0.01
S. Coastal Salt Marsh	1.37	3.37	2.35	5.79	1.87	4.63	1.43	3.53
Salt Marsh Transition	0.05	0.12	0.07	0.17	0.18	0.44	0.08	0.19
Southern Willow Scrub	0.07	0.18	0.09	0.22	0.07	0.19	0.07	0.18
So. Willow Scrub (D)	0.78	1.92	0.81	2.00	0.82	2.04	0.74	1.84
Southern willow scrub/FWM	0.16	0.38	0.16	0.38	0.16	0.38	0.16	0.38
Other Waters of the U.S.	0.02	0.06	0.01	0.03	0.01	0.03	0.01	0.03
Open Water under existing Bridge[1]	0.02	0.04	0.02	0.04	0.02	0.04	0.02	0.04

Impacts were calculated in ac and converted and rounded off to ha.
(D) = Disturbed, So. = Southern, Chap = Chaparral. FWM = Freshwater Marsh
1. Open water already shaded and impacted with columns of the existing freeway bridge
2. CSS already mitigated by the Del Mar Auxiliary Lane Project

Table 3.17.3: Permanent and Temporary Impacts to Eelgrass by Alternative

	10+4 Barrier		10+4 Buffer		8+4 Barrier		8+4 Buffer	
Permanent Impacts	Ha	Ac	Ha	Ac	Ha	Ac	Ha	Ac
Agua Hedionda	0.09	0.22	0.05	0.13	0.08	0.20	0.03	0.08
Batiquitos	0.01	0.02	0.01	0.02	0.01	0.03	0.01	0.01
Total	0.10	0.24	0.06	0.15	0.09	0.23	0.04	0.10
Temporary Impacts								
Agua Hedionda	0.04	0.10	0.04	0.10	0.04	0.09	0.04	0.10
Batiquitos	0.06	0.16	0.06	0.16	0.06	0.15	0.06	0.15
Total	0.10	0.26	0.10	0.26	0.10	0.24	0.10	0.25

3.17.3 Avoidance, Minimization and/or Mitigation Measures

Permanent impacts to CSS have been minimized where possible along the right-of-way by construction of retaining walls and minimizing the grading behind the walls. There may be temporary impacts due to construction access in these areas; however, the CSS would be restored when construction is completed.

Due to the fact that I-5 already crosses six coastal lagoons, wetland impacts could not be completely avoided. Several design alternatives were examined to minimize fill placed in the lagoons, including using retaining walls and steeper fills than 2:1. However, due to liquefaction of soils in the lagoons and the need for very deep footings, retaining walls were impractical. The sandy soils within the vicinity of the lagoons would not support steeper fill slopes. Although impacts to the lagoons cannot be avoided, there are ongoing studies of the hydrology in the lagoons and methods to enhance water flow under the bridges that would be used during the bridge design.

The following conservation measures are proposed for the project during construction to minimize impacts to sensitive communities. The remainder of the conservation measures for species and compensatory mitigation for the project is discussed in *Sections 3.19, 3.20,* and *3.21*.

- All native habitats outside the permanent and temporary construction limits would be designated as Environmentally Sensitive Areas (ESA) on project maps. ESAs shall be temporarily fenced during construction with orange plastic snow fence. No access would be allowed within the ESAs.
- Cut slopes would be revegetated with native upland habitats with similar composition to those within the project limits. Fill slopes and areas adjacent to wetlands and drainages would be revegetated with appropriate native upland and wetland species. The revegetated areas would have temporary irrigation and be planted with native container plants and seeds selected by the biologist. There would be at least three years of plant establishment/ maintenance on these slopes to control invasive weeds and ensure that the plants become established. Bioswales and detention basins would be planted with appropriate native species as determined by the biologist and storm water personnel. Slopes adjacent to developed urban areas would be vegetated with native and drought tolerant non-invasive species selected by the biologist and landscape architect. Interchanges located in urban areas would be landscaped with native or ornamental non-invasive species.
- Any seeding of native upland habitats would be completed between October and February to ensure that the seed has proper conditions for germination.
- Duff from areas with CSS, maritime succulent scrub, and maritime chaparral would be saved to aid in revegetation of the slopes with native habitats.
- All temporary impact areas would be revegetated and restored to pre-existing conditions.

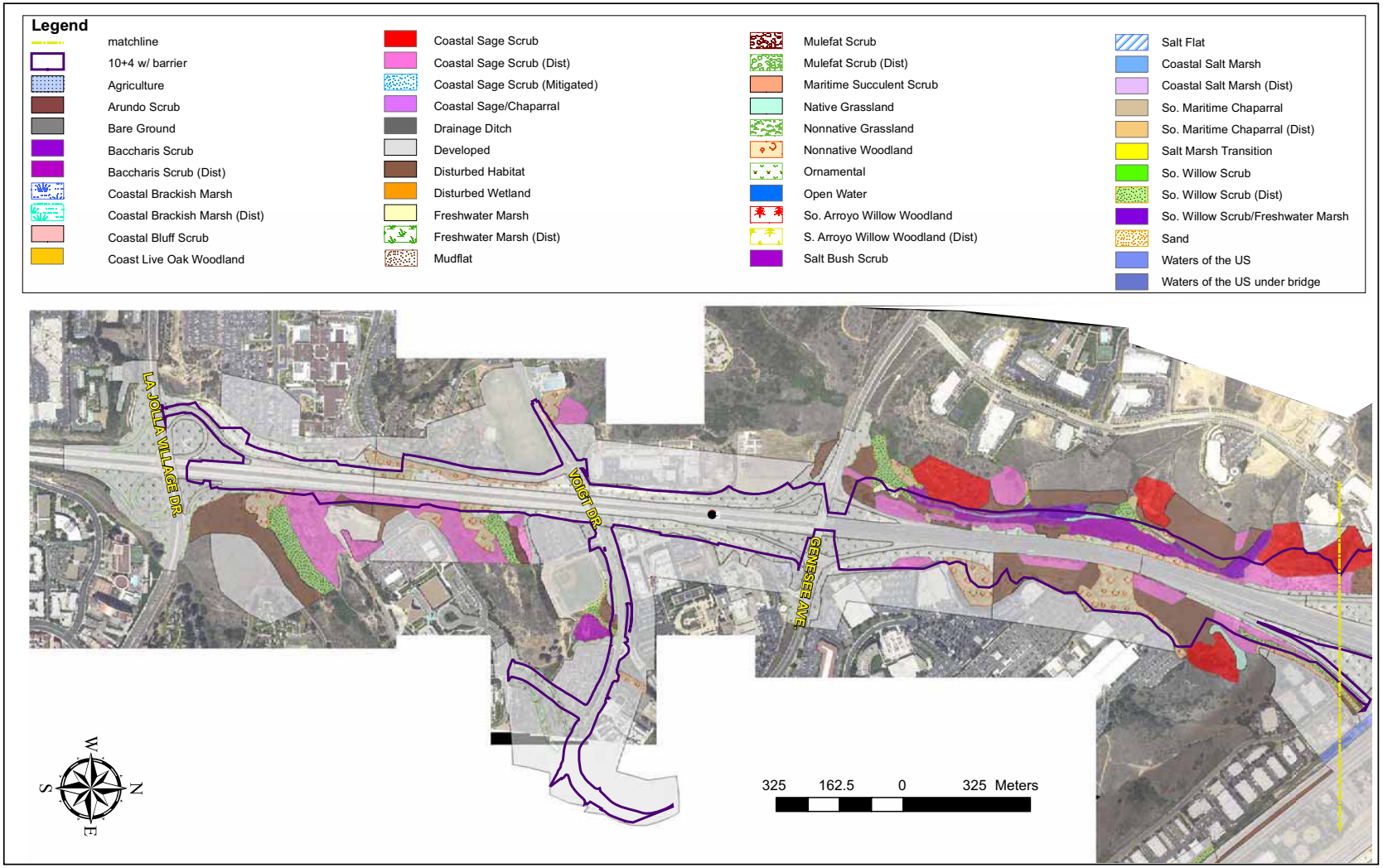


Figure 3-17.1a Vegetation Communities

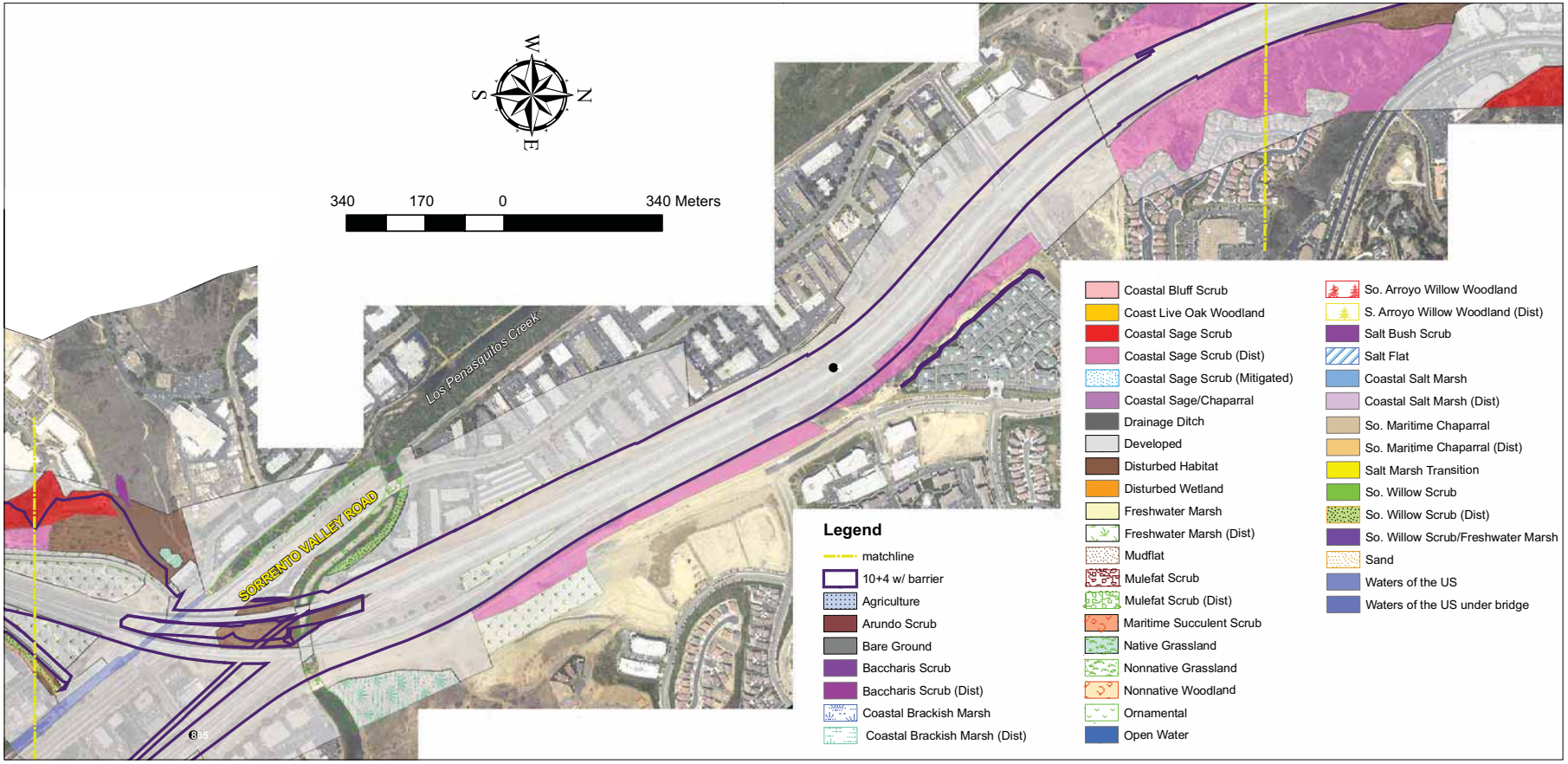


Figure 3-17.1b Vegetation Communities

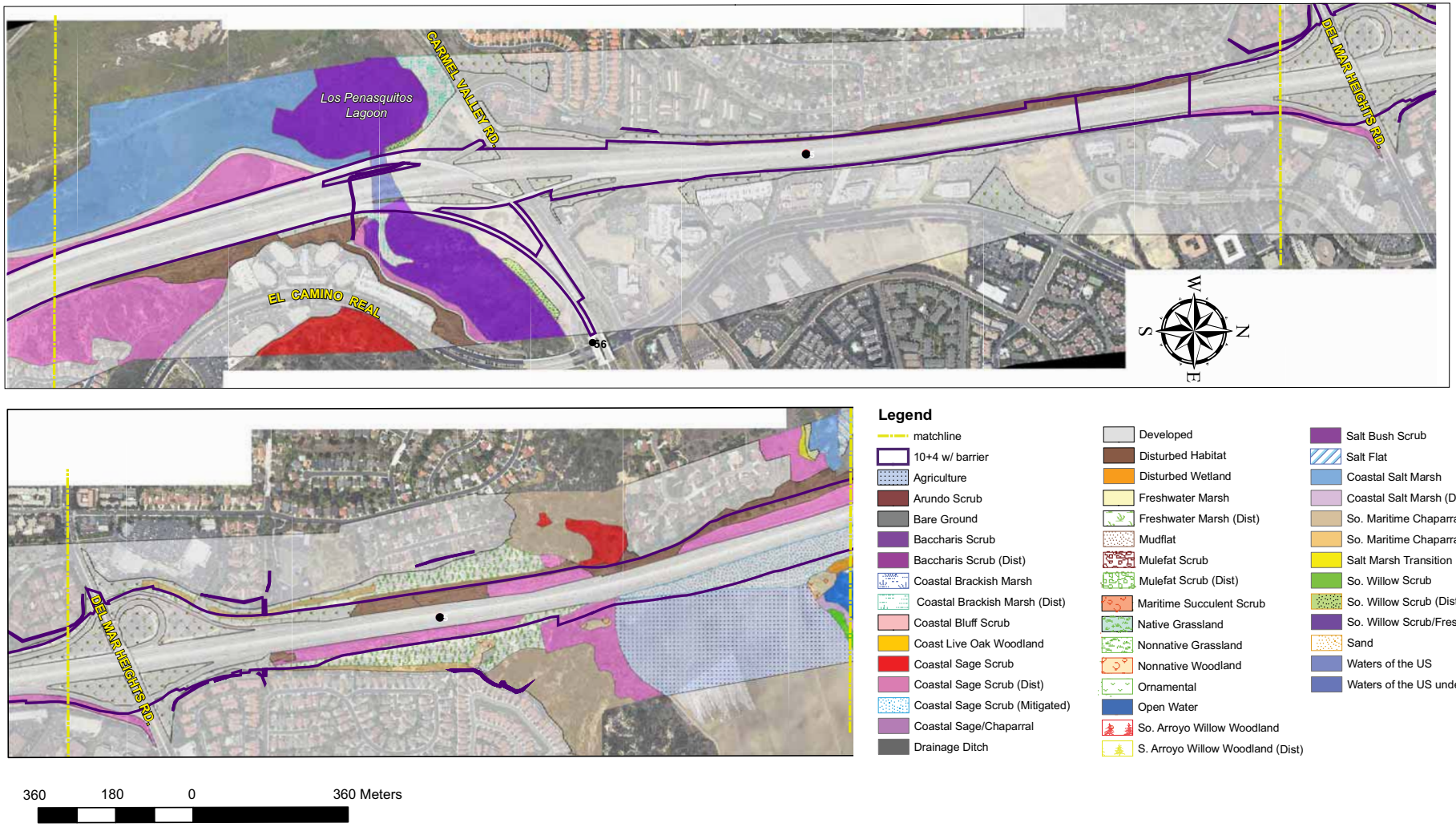


Figure 3-17.1c Vegetation Communities

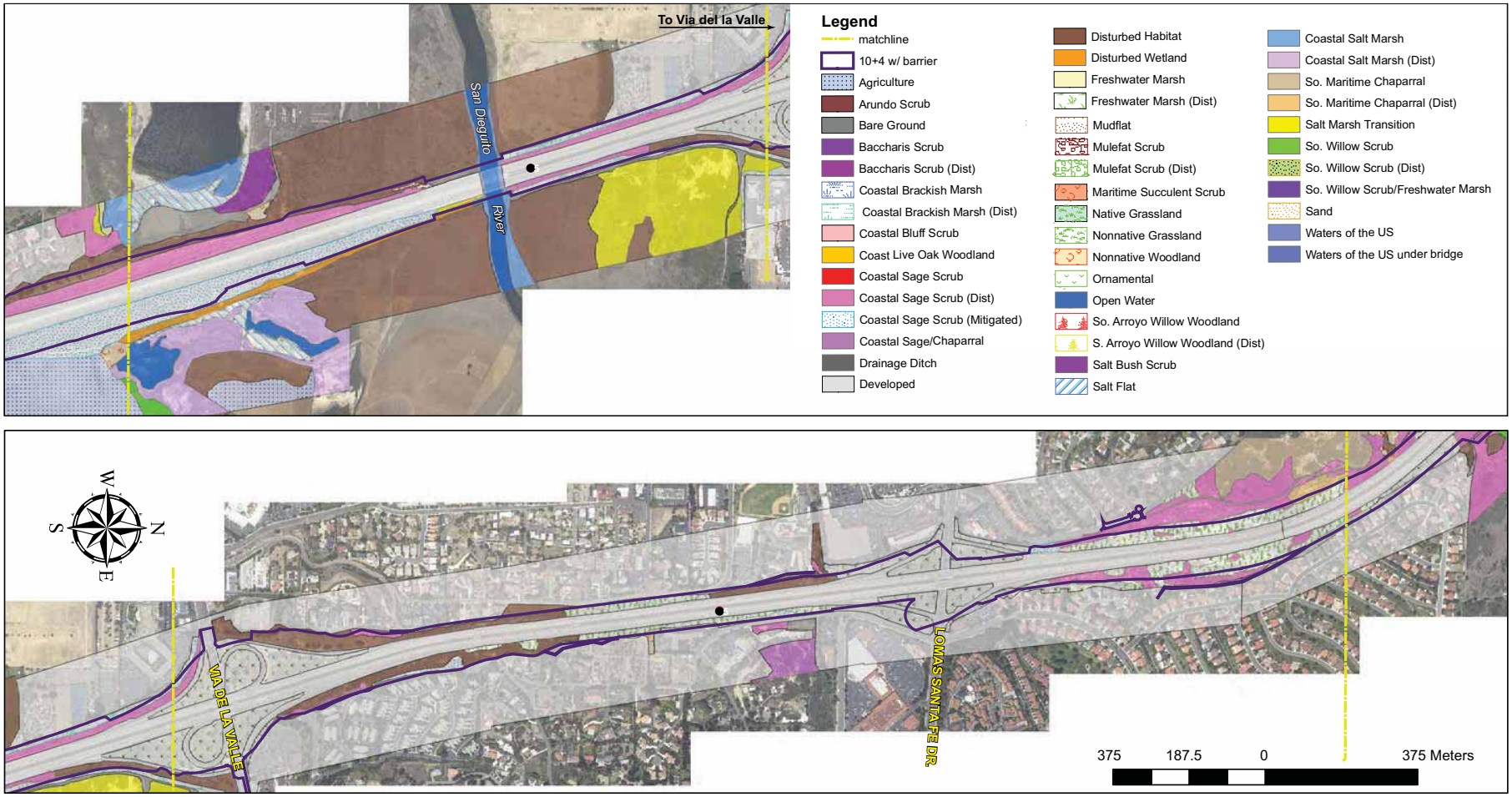


Figure 3-17.1d Vegetation Communities

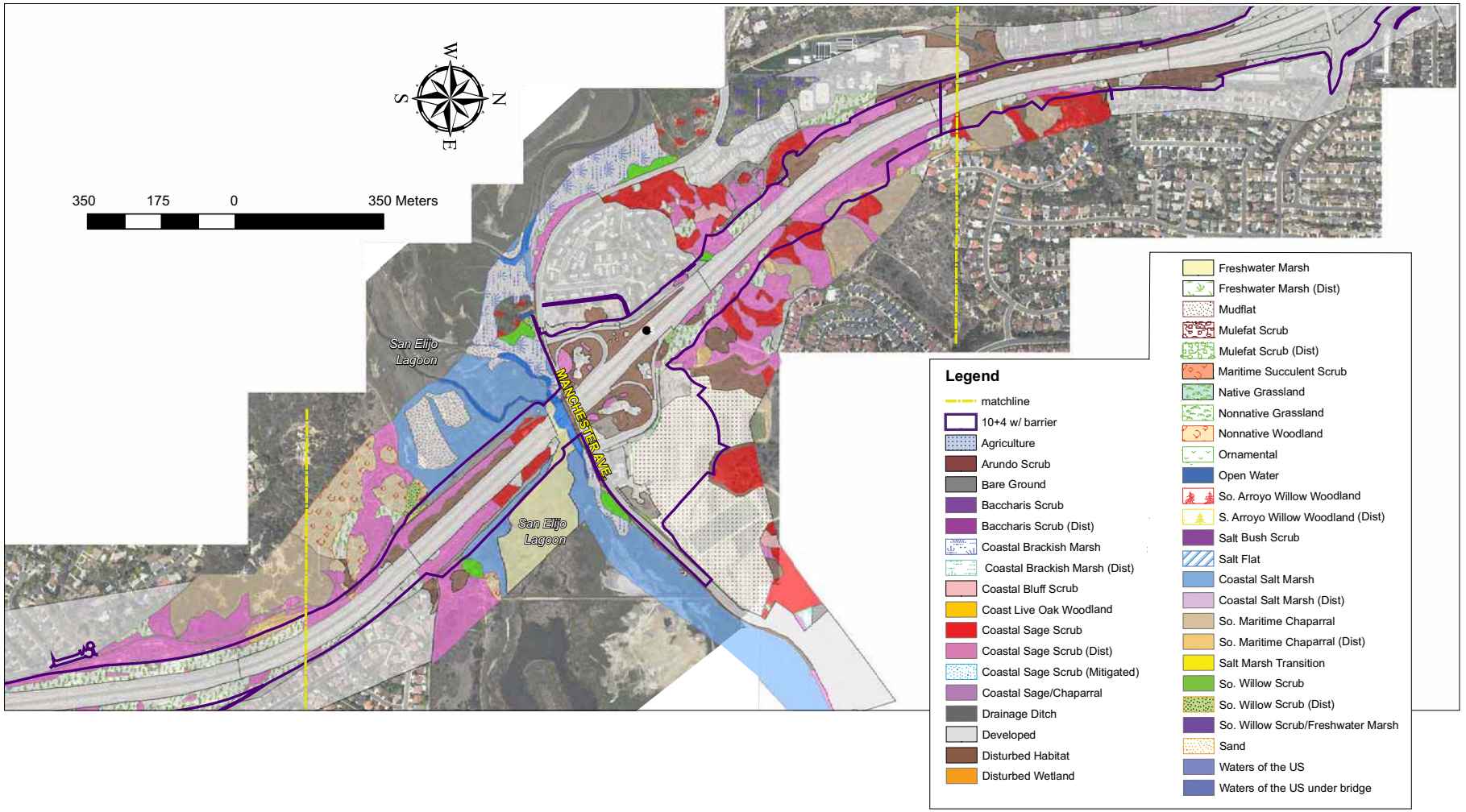


Figure 3-17.1e Vegetation Communities

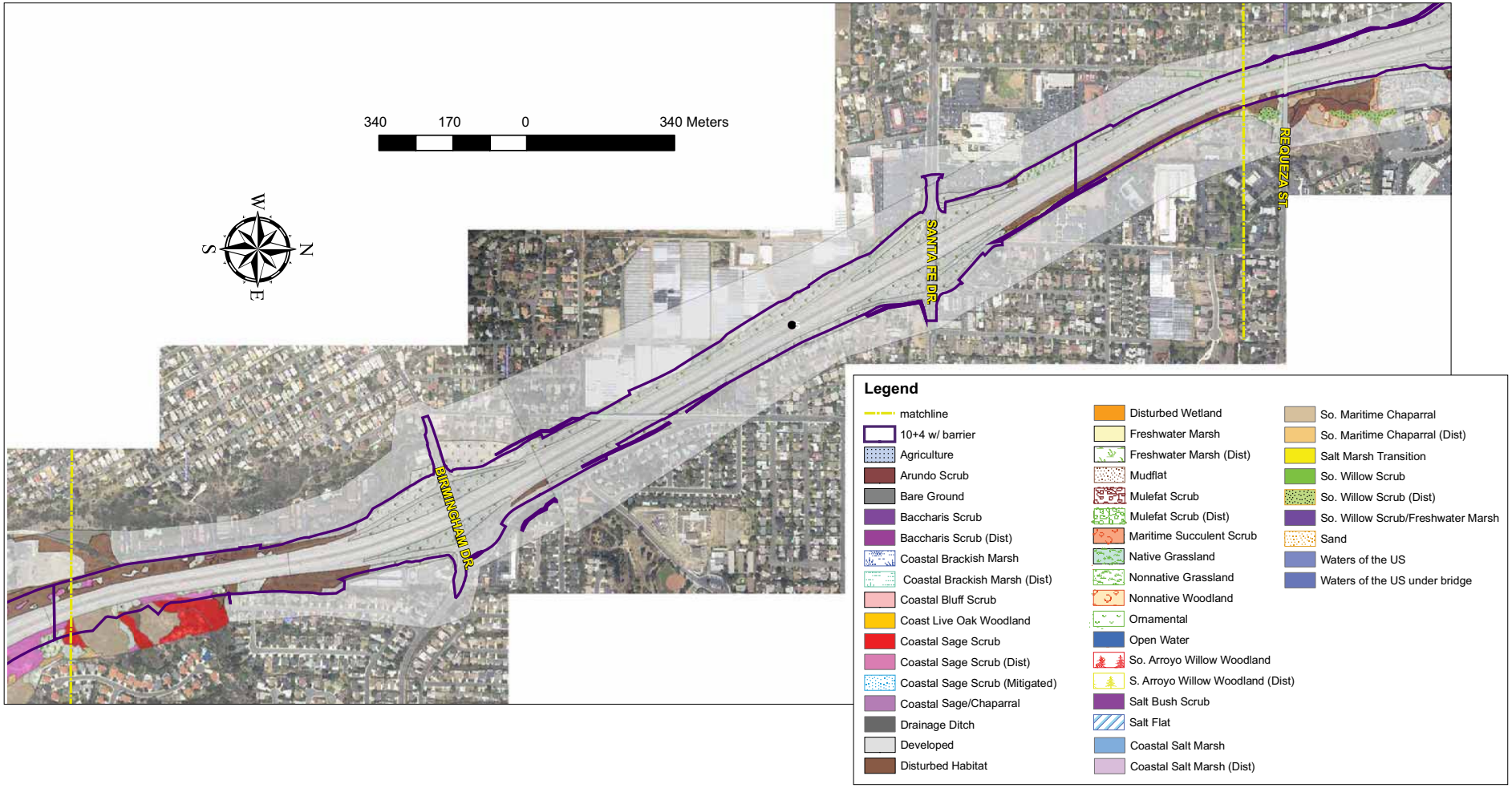


Figure 3-17.1f Vegetation Communities

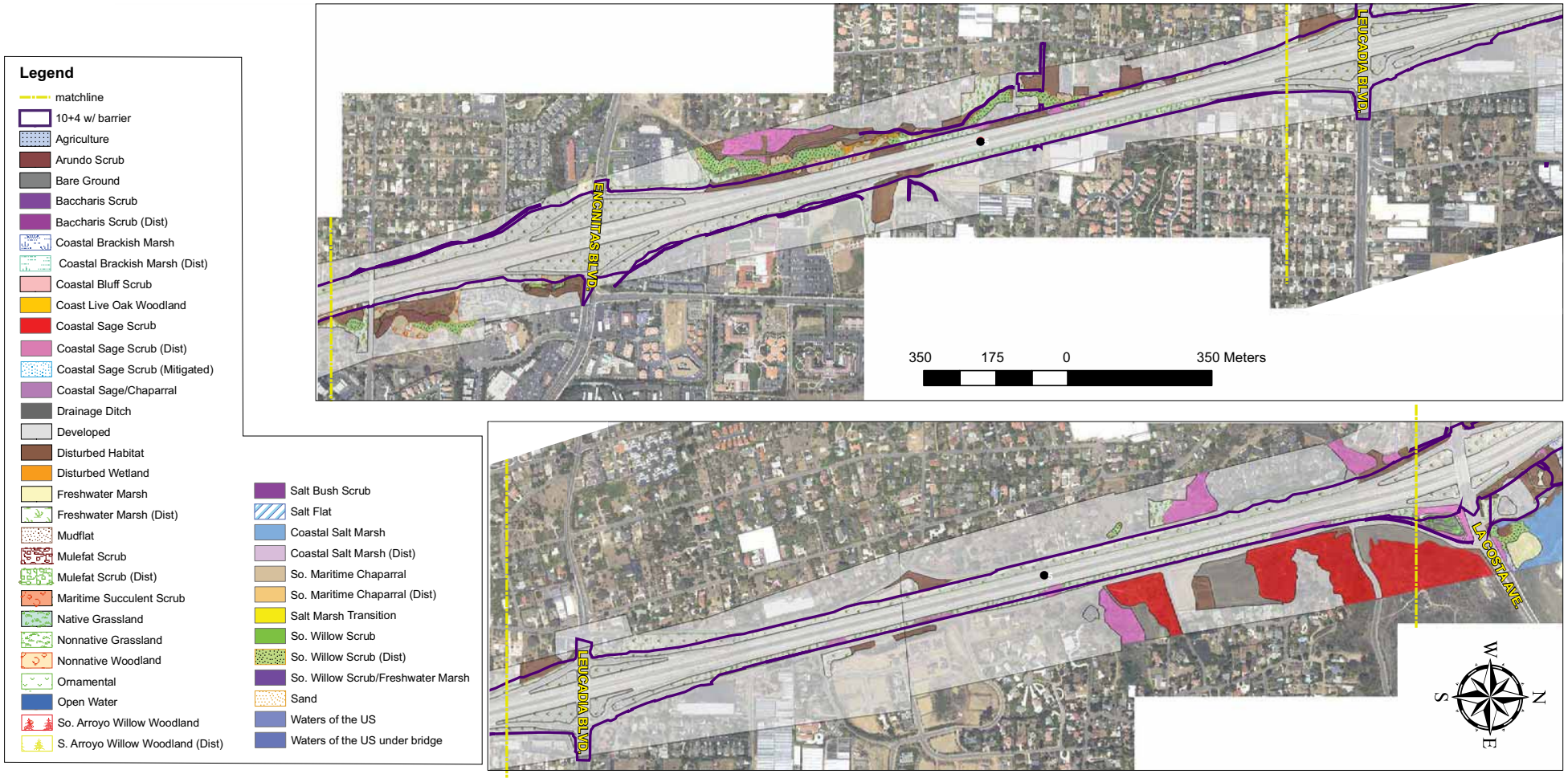


Figure 3-17.1g Vegetation Communities

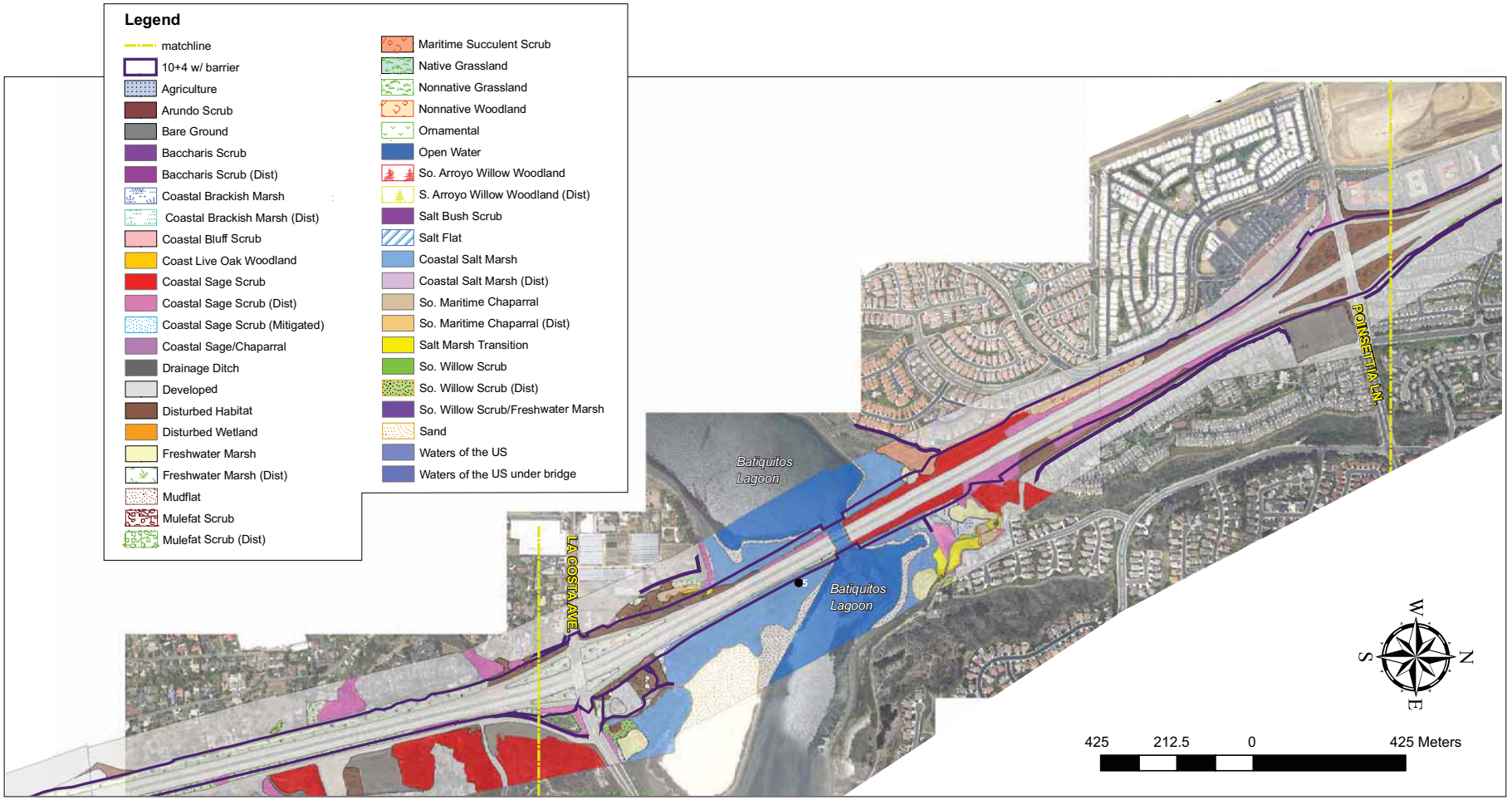


Figure 3-17.1h Vegetation Communities

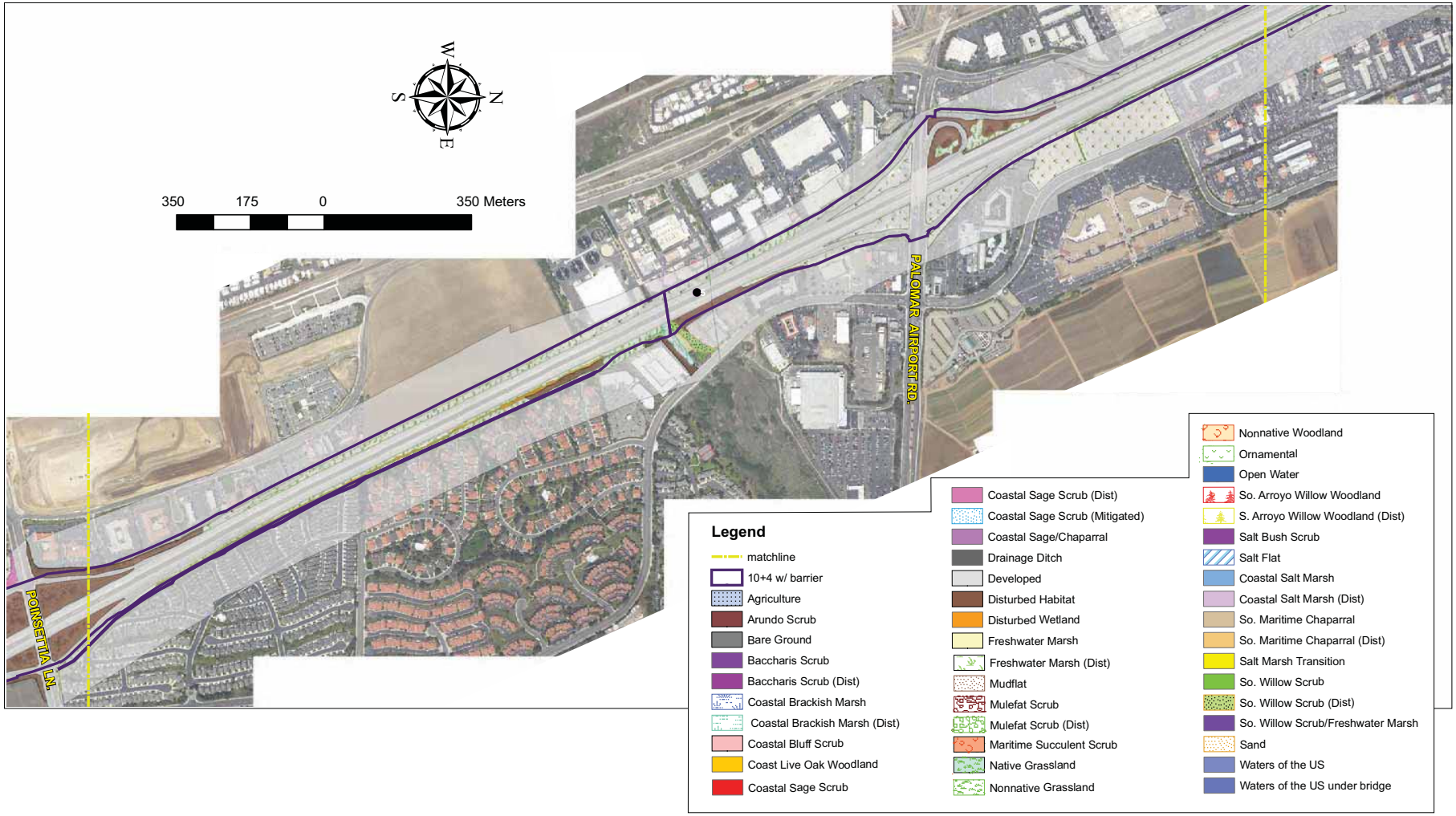


Figure 3-17.1i Vegetation Communities

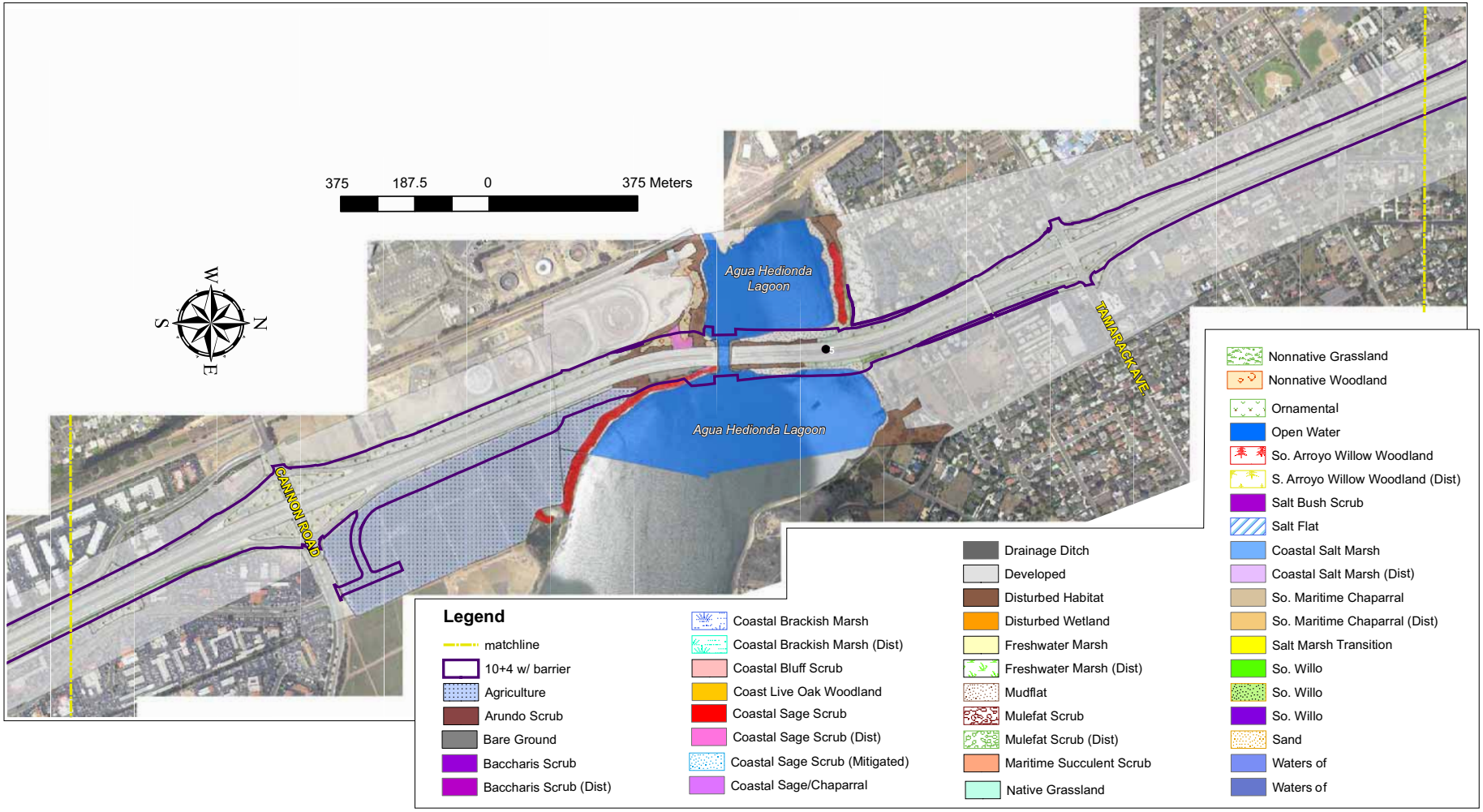


Figure 3-17.1j Vegetation Communities

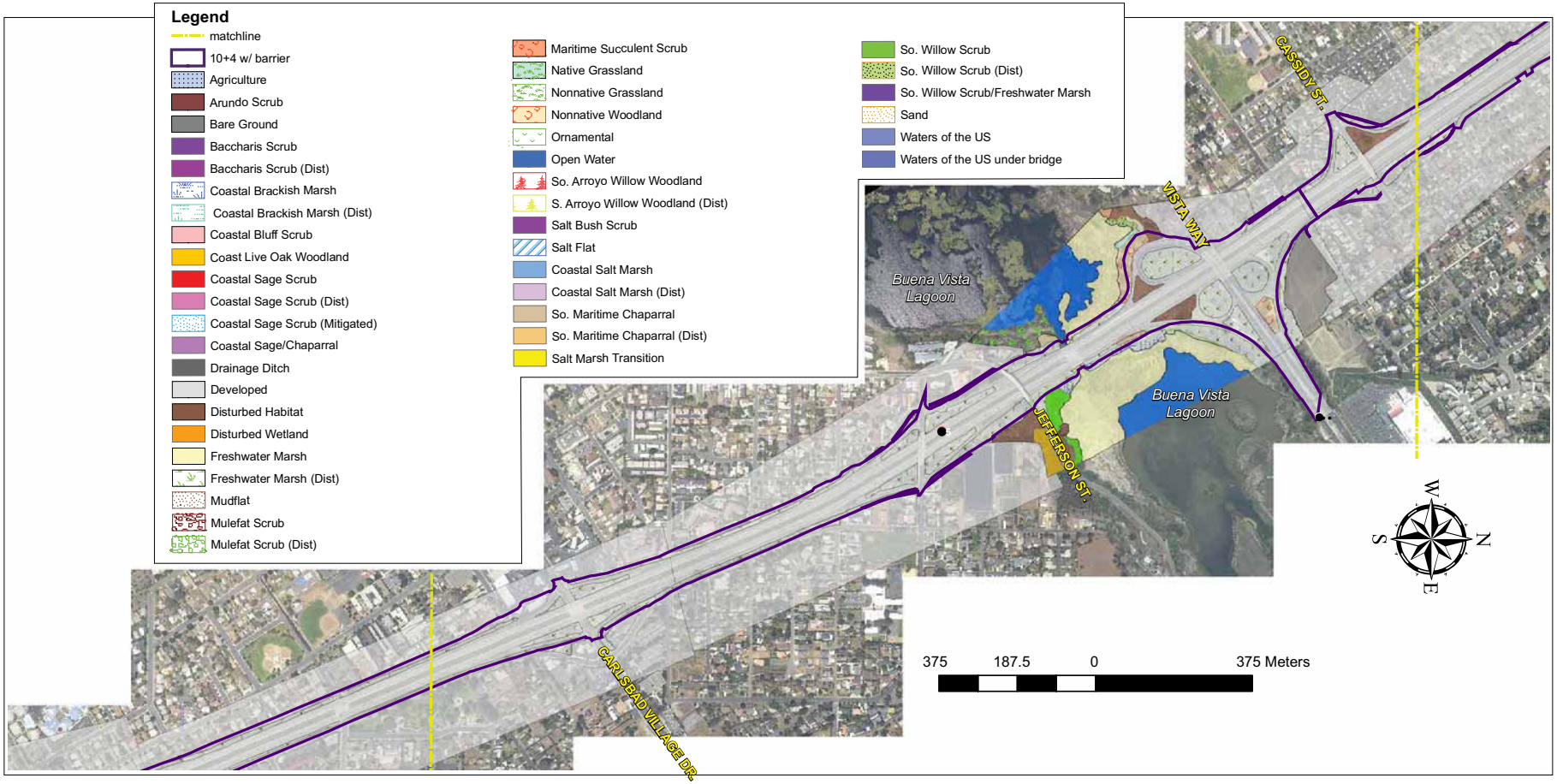


Figure 3-17.1k Vegetation Communities

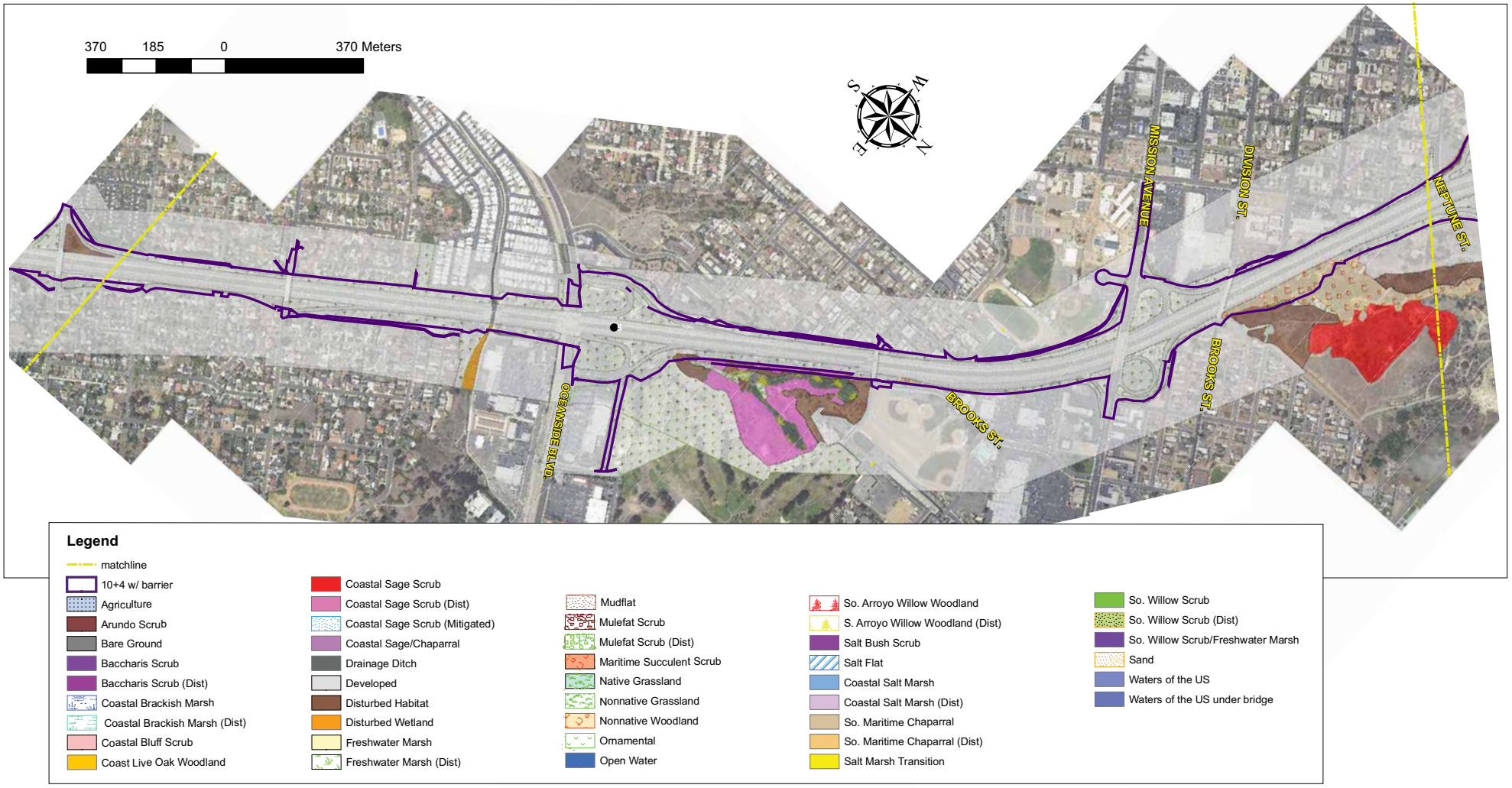


Figure 3-17.1l Vegetation Communities

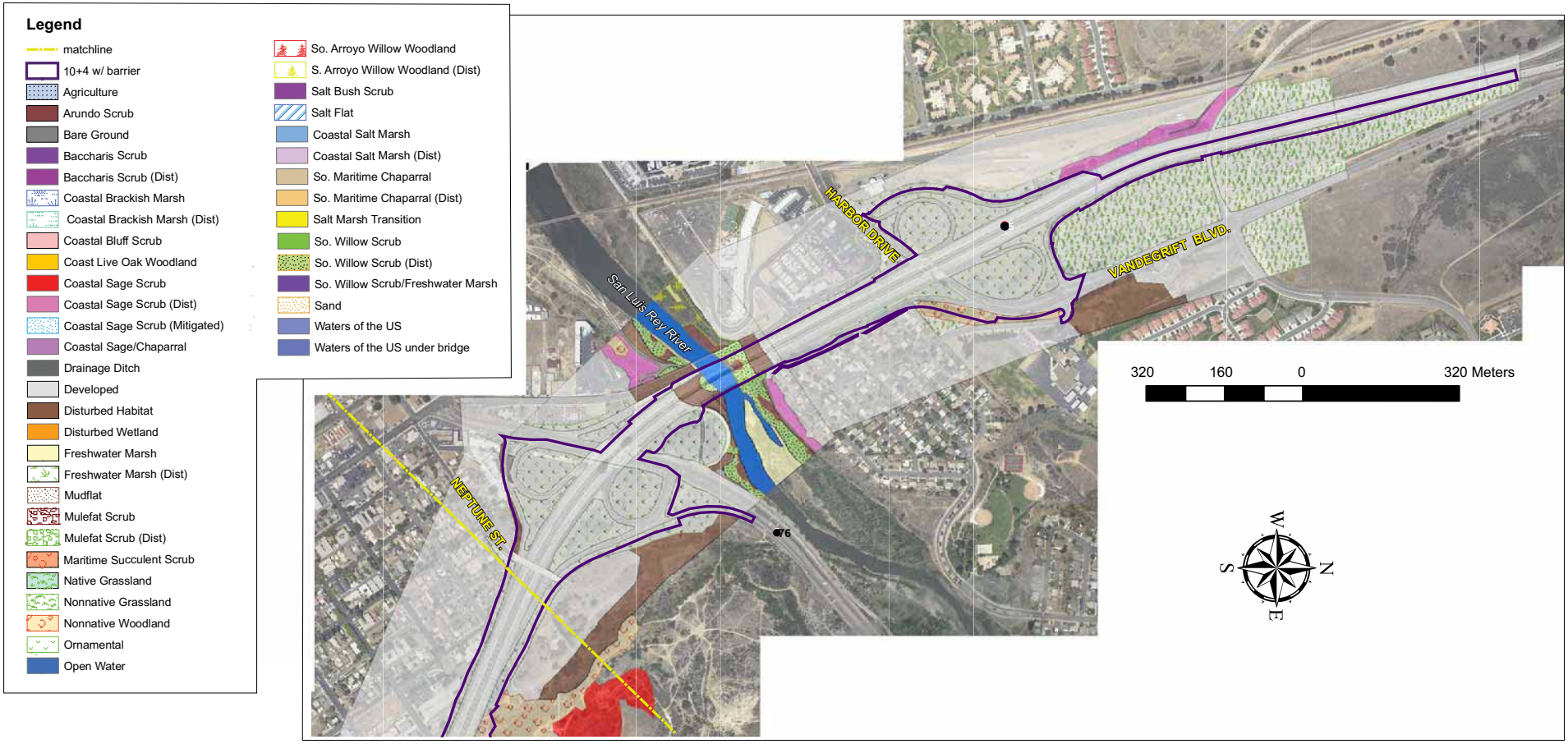
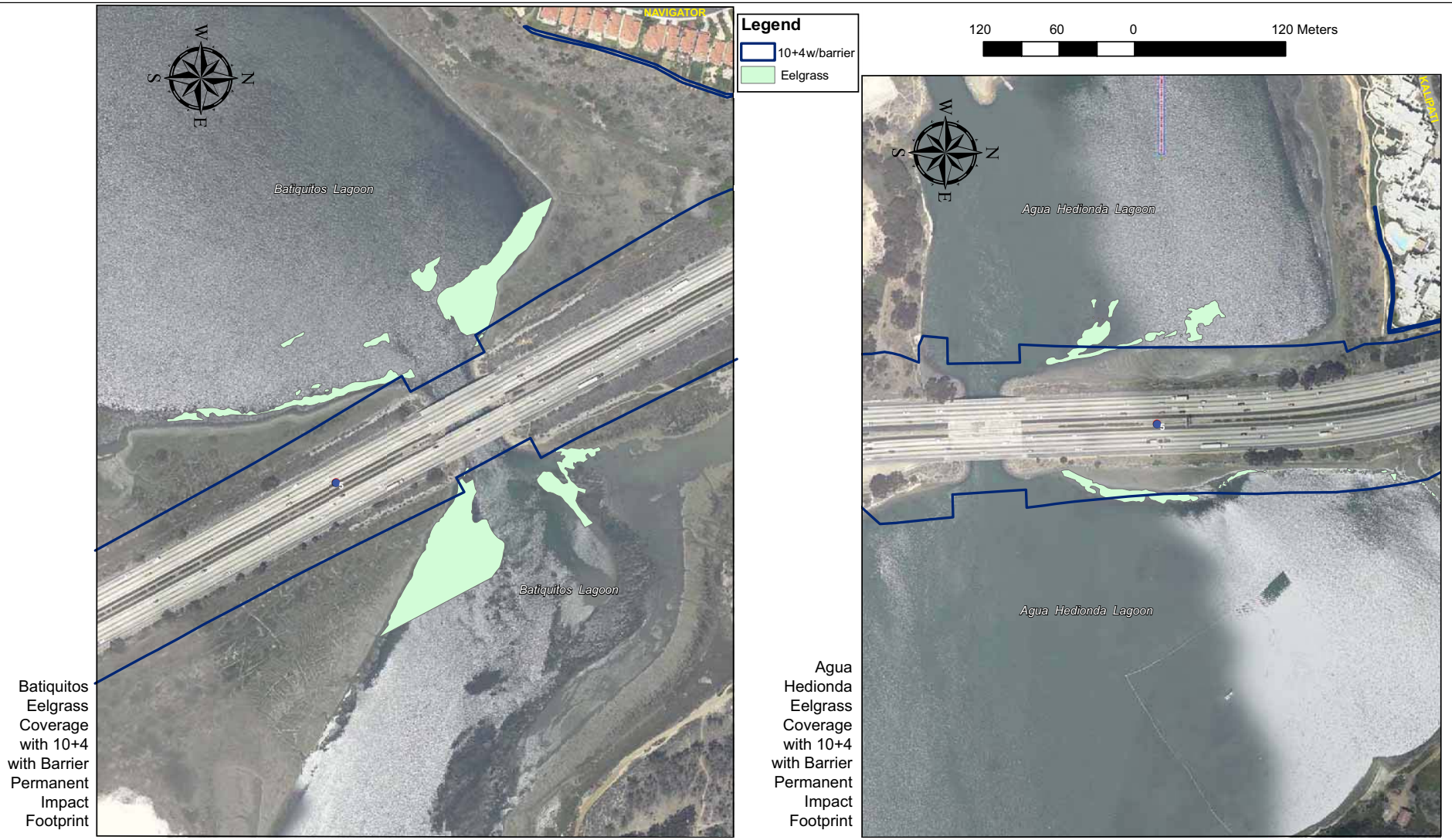


Figure 3-17.1m Vegetation Communities



Batiquitos Eelgrass Coverage with 10+4 with Barrier Permanent Impact Footprint

Agua Hedionda Eelgrass Coverage with 10+4 with Barrier Permanent Impact Footprint

Figure 3-17.2 Eelgrass Coverage

3.18 Wetlands and Other Waters

3.18.1 Regulatory Setting

Wetlands and other waters are protected under a number of laws and regulations. At the federal level, the Clean Water Act (CWA) (33 U.S.C. 1344) is the primary law regulating wetlands and waters of the U.S. The CWA regulates the discharge of dredged or fill material into Waters of the US, including wetlands. Waters of the United States include navigable waters, interstate waters, territorial seas and other waters that may be used in interstate or foreign commerce. To classify wetlands for the purposes of the CWA, a three-parameter approach is used that includes the presence of hydrophytic (water-loving) vegetation, wetland hydrology, and hydric soils (soils subject to saturation/inundation). All three parameters must be present, under normal circumstances, for an area to be designated as a jurisdictional wetland under the CWA.

Section 404 of the CWA establishes a regulatory program that provides that no discharge of dredged or fill material can be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded. The Section 404 permit program is run by the U.S. Army Corps of Engineers (ACOE) with oversight by the U.S. Environmental Protection Agency (EPA).

Caltrans, FHWA, ACOE, EPA, and USFWS entered into a Memorandum of Understanding (MOU) to integrate NEPA and the Clean Water Act for EIS projects that have 2.02 ha (5 ac) or more of permanent impact to waters of the United States. Under this MOU, the signatory agencies agree to coordinate at three checkpoints: 1) purpose and need, 2) identification of range of alternatives, and 3) preliminary determination of the least environmentally damaging practicable alternative (LEDPA) and conceptual mitigation plan. The goal of the MOU process is to allow the ACOE to more efficiently adopt the EIS for their Section 404 permit action.

The Executive Order for the Protection of Wetlands (E.O. 11990) also regulates the activities of federal agencies with regard to wetlands. Essentially, this executive order states that a federal agency, such as the Federal Highway Administration, cannot undertake or provide assistance for new construction located in wetlands unless the head of the agency finds: 1) that there is no practicable alternative to the construction and 2) the proposed project includes all practicable measures to minimize harm.

At the state level, wetlands and waters are regulated primarily by the California Department of Fish and Game (CDFG), the California Coastal Commission (CCC), and the Regional Water Quality Control Board (RWQCB). Sections 1600-1607 of the Fish and Game Code require any agency that proposes a project that would substantially divert or obstruct the natural flow of or substantially change the bed or bank of a river, stream, or lake to notify CDFG before beginning construction. If CDFG determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement would be required. CDFG jurisdictional limits are usually defined by the tops of the stream or lake banks, or the outer edge of riparian vegetation, whichever is wider. Wetlands under jurisdiction of the ACOE may or may not be included in the area covered by a Streambed Alteration Agreement obtained from the CDFG.

The RWQCBs were established under the Porter-Cologne Water Quality Control Act to oversee water quality. The RWQCB also issues water quality certifications in compliance with Section 401 of the CWA. Please see the *Section 3.10 Water Quality* for additional details.

3.18.2 Affected Environment

The wetland communities are described above in *Section 3.17*. Within those plant communities there may also be areas designated by regulation as having jurisdiction by the ACOE and/or the CDFG and the CCC. The ACOE regulates wetlands as defined in the ACOE Wetlands Delineation Manual (ACOE 1987) and waters of the U.S. as described above. By ACOE definition wetlands are:

> Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in the saturated soil conditions.

Waters of the U.S. include natural drainages up to the limit of the ordinary high water mark, which is defined as the:

> line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

By definition all ACOE jurisdiction wetlands are waters of the U.S. However, not all waters of the U.S. are considered wetlands; therefore, non-wetland ACOE jurisdictional areas, are identified as other waters of the U.S. *(Figures 3-18.1a through 3-18.1h*). On October 24, 2009 the ACOE concurred with the submitted wetlands delineation.

The CDFG only requires one of the three criteria that the ACOE requires in the definition of a wetland. Pursuant to CDFG Code 1602 a streambed alteration agreement is needed for projects which would:

> divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake designated by the department in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit, use material from the streambeds designated by the department, or result in the disposal or deposition of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into any river, stream, or lake designated by the department.

This generally includes all natural drainages, including any adjacent riparian habitat, but usually does not cover isolated wetlands.

The CCC defines wetlands similar to the CDFG. CCC Administrative Regulations (Section 13577(b)) further define a wetland as:

> Wetlands are lands where the water table is at, near, or above the land surface long enough to promote the formation of hydric soils or to support the growth of hydrophytes, and shall also include those types of wetlands where vegetation is lacking and soil is poorly developed or absent as a result of frequent or drastic fluctuations of surface water levels, wave action, water flow, turbidity or high concentrations of salt or other substance in the substrate. Such wetlands can be recognized by the presence of surface water or saturated substrate at some time during each year and their location within, or adjacent to, vegetated wetlands or deepwater habitats.

There are CDFG, CCC, and ACOE jurisdictional wetlands throughout the Study Area. CDFG and CCC wetlands are identified by habitat type, which are shown in *Figures 3-17.1a through 3-17.1m* and are discussed in detail in *Section 3.17*. ACOE jurisdiction wetlands and other waters of the U.S. are shown in *Figures 3-18.1a through 3-18.1h*. The lagoons and their fringing habitats, rivers, creeks, and drainages are considered wetlands by one, two or all three of the agencies. CCC and CDFG jurisdiction wetlands were primarily mapped based on habitats (see *Section 3.17*), while ACOE jurisdiction wetlands were delineated based on the 1987 Manual (ACOE).

Habitats by Watershed

Different types of wetlands and waters of the U.S. have been divided by watershed as identified from one high point of I-5 to the next high point and the body of water in between. For instance San Elijo Lagoon watershed includes wetlands and non-wetland waters of the U.S. between Lomas Santa Fe in the south to just south of the Santa Fe interchange in the north. Each wetland/watershed provides unique functions and values ranging from water quality improvements by filtering nutrients and sediments from the water column, to flood relief, to wildlife habitats. The following 11 watersheds and their functions and values were identified in the project vicinity.

San Clemente Creek
A small wetland that is fed primarily by urban runoff flows into a canyon east of I-5 near the Voigt Street. This small drainage has some willows and mulefat as well as a number of invasive species. This wetland area provides a limited area of wildlife habitat as well as some water quality functions. From this canyon the water flows through culverts until it ultimately empties into the drainage along Gilman Drive and finally into San Clemente Creek (*Figure 3-18.1h*).

Los Peñasquitos Lagoon
This watershed extends from the southern limits of the project on I-5 and I-805 to the Del Mar Heights Road interchange. The watershed includes the following areas, Carroll Canyon/Sorrento Creek, Los Peñasquitos Creek, Carmel Creek, and Los Peñasquitos Lagoon (*Figures 3-18.1h and 3-18.1g*). These wetlands provide important wildlife habitat for threatened and endangered species, migratory birds, large mammals, and many different wildlife species. These wetlands also provide flood relief by allowing high flows to spread out and enter the larger water courses. They also provide water quality improvements by slowing the flow of water and allowing sediment loads, nutrients, and toxins from dropping out and being absorbed by the vegetation.

San Dieguito Lagoon
This watershed extends from the Del Mar Heights Road interchange to the Lomas Santa Fe Interchange and includes all drainages along I-5 into the San Dieguito River/Lagoon (*Figure 3-18.1g*). The San Dieguito River and Lagoon provides similar wetland functions to Los Peñasquitos Lagoon. A large restoration project within this watershed began in 2006. The restoration project would restore much land around the lagoon that was fill. The wetland habitats adjacent to the right-of-way would have even greater wildlife value after the restoration is completed.

San Elijo Lagoon
The San Elijo Lagoon watershed extends from Lomas Santa Fe to just south of the Santa Fe Road interchange (Figure 3-18.1f). This watershed encompasses all of the drainages into San Elijo Lagoon. San Elijo Lagoon provides important wildlife habitat, flood relief, and water quality improvement similar to Los Peñasquitos Lagoon.

The lagoon supports light-footed clapper rail, least Bell's vireo (*Vireo bellii pusillus*), and there are California gnatcatchers (*Polioptila californica californica*) on the adjacent uplands. Water quality and flood relief are important functions of this lagoon as well.

Cottonwood Creek
The Cottonwood Creek watershed within this project extends from just south of the Santa Fe Road interchange to the Leucadia Boulevard interchange (*Figures 3-18.1f and 3-18.1e*). Cottonwood Creek is primarily channelized or underground near I-5. Several drainages feed into Cottonwood Creek from the east side of I-5 to the west side where the outlet has recently been restored to its mouth at the Pacific Ocean near Encinitas Boulevard. Cottonwood Creek and its tributary, Moonlight Creek, flow through a very urbanized section of Encinitas. Cottonwood Creek often flows through culverts and channels near I-5 and does not provide much flood relief, water quality improvement or wildlife habitat until it flows west of I-5 into the newly created channels in Cottonwood Park. Moonlight creek flows parallel to I-5 north of Encinitas Boulevard and feeds into Cottonwood Creek. Moonlight Creek has some freshwater marsh habitat and southern willow scrub and provides habitat to some riparian bird species and provides some water quality and flood relief functions.

Batiquitos Lagoon
This watershed extends from Leucadia Blvd. north to Poinsettia Avenue (*Figure 3-18.1d*). This area encompasses Batiquitos Lagoon and any drainages that feed the lagoon. Batiquitos Lagoon provides another important habitat for many wildlife species including threatened and endangered species. California least tern (*Sterna antillarum browni*), western snowy plover (*Charadrius alexandrinus nivosus*), and light-footed clapper rail are all endangered species that use portions of the lagoon habitat. The large open water portions of Batiquitos Lagoon also provide important habitat for fish, waterfowl, and shorebirds. The slopes of the lagoons are important wildlife corridors for both large and small mammal movement. The lagoon also provides water quality functions and flood relief.

Encina Creek
This watershed extends from Poinsettia Avenue to Palomar Airport Road (*Figure 3-18.1c*). The Encina Creek watershed includes the creek itself and a long earthen drainage parallel to I-5 that is fed mostly by urban and freeway runoff that then flows into the creek through a concrete channel. Encina Creek flows from east to west under I-5. Encina Creek is disturbed by many invasive plant species and has been channelized along some of its length. The long drainage parallel to I-5 is fed by urban and freeway runoff; it supports cattails and amphibians as well as some bird species. Encina Creek does provide some limited wildlife habitat and water quality and flood relief. However, due to the disturbed nature of this creek, the function and value of the wetlands are limited compared to the watersheds that flow into lagoons.

Aqua Hedionda Lagoon
This watershed extends from Palomar Airport Road to just north of Tamarack Avenue (*Figure 3-18.1b*). This area contains a concrete lined drainage parallel to I-5 that has some freshwater marsh vegetation and carries primarily urban and freeway runoff. The developed area between Tamarack Avenue and Carlsbad Village Drive does not contain any wetlands or drainage ditches; therefore, this area is not included in any of the watersheds. Agua Hedionda Lagoon near I-5 is primarily open water habitat with some mud flat and a small fringe of salt marsh vegetation. Agua Hedionda is fed by some small drainage ditches that capture

urban runoff, but provide little wetland functions. Agua Hedionda Lagoon provides open water habitat for fish, waterfowl, and shorebirds. It also provides water quality and flood relief for areas upstream and downstream of the lagoon.

Buena Vista Lagoon
Buena Vista Lagoon watershed extends from Carlsbad Village Drive to north of California Street interchange (*Figure 3-18.1b*). The lagoon itself contains the only wetland/Waters of the U.S. within this watershed. Buena Vista Lagoon is a freshwater lagoon that for the most part is not connected to the ocean except through a system of tide gates. Buena Vista Lagoon is a combination of freshwater marsh, brackish marsh, and open water habitat that supports a variety of sensitive and migratory birds. The cattails in the marsh provide habitat and take up nutrients in the water that flows into the lagoon increasing water quality. Buena Vista does provide some flood relief due to its size; however, the tide gates mute the benefit in the western basin.

Loma Alta Creek
Loma Alta Creek watershed extends from north of the California Street interchange north to Mission Avenue (*Figure 3-18.1a*). There are several concrete lined ditches that feed into this highly disturbed creek. In addition, there is a riparian area east of I-5 and north of Oceanside Boulevard that ultimately gets piped into this creek as well. The creek flow is fed by urban run off and storm flows. The creek does provide a limited amount of water quality filtration and flood relief; however, due to its highly disturbed nature the benefit is minimal.

San Luis Rey River
The San Luis Rey River watershed extends from Mission Avenue north to the end of the project (*Figure 3-18.1a*). The San Luis Rey River is the main wetland within this watershed; however, there are some manmade drainage ditches that parallel I-5 near Vandergrift Boulevard overpass. The San Luis Rey River is one of the few truly perennial rivers in San Diego County. The San Luis Rey River in the vicinity of I-5 is a combination of open water habitat, freshwater marsh, arundo scrub, and riparian that provides habitat for a variety of sensitive and common wildlife. The San Luis Rey River is also plays and important role in flood relief and water quality improvements due to the filtering of water by freshwater marsh species. A recent project was undertaken by the City of Oceanside to remove a large quantity of arundo in the San Luis Rey River upstream of I-5 to improve its ability to handle floodwaters.

3.18.3 Environmental Consequences

I-5 is an existing freeway that crosses six lagoons, a river, and some additional smaller drainages. The No Build Alternative is the only alternative that would avoid the majority of the impacts to wetlands. Some of the projects that would go forward under the No Build scenario would involve wetland impacts. The build alternatives all are variations of widening of the existing alignment. There is no way to avoid impacts to the wetlands entirely and still meet the purpose and need for the project. The alternatives which were not carried forward also impacted wetlands. The length of the proposed north-south project and the fact that the watersheds drain from east to west would make it impossible to avoid crossing any wetlands.

The four build alternatives were approved by the MOU regulatory agencies in NEPA 404 coordination. Efforts to minimize fill in the wetland examined using retaining walls; however, the liquefied soils at the lagoons would require very deep footings over 25 m (82 ft) and would be prohibitively expensive. Varying bridge designs are being examined to enhance flow under the bridges to increase water quality in the eastern basins of the lagoons. Caltrans, in conjunction with the ACOE and restoration efforts at San Elijo Lagoon and Buena Vista Lagoon, are looking at building longer bridges that would result in removing some of the existing fill at the lagoons.

State of California jurisdictional wetlands were delineated by habitat type. Impacts to the wetland habitats and consequently to the State jurisdictional wetlands are detailed in *Section 3.17*. The wetland and other waters of the U.S. habitats described in this section are a subset of the State jurisdictional wetland (*Tables 3.18.1* and *3.18.2*). *Table 3.18.1* describes the permanent and temporary impacts to ACOE jurisdictional wetlands and other waters of the U.S. *Figures 3-18.1a through 3-18.1h* show the jurisdictional wetlands and waters of the U.S with the permanent impact area for the 10+4 with Barrier alternative.

Impacts from each of the build alternatives to the lagoon habitats would incrementally decrease the quality and quantity of habitat available for use by wildlife species including migratory birds and listed species. There would also be affects to each of the lagoons abilities to provide flood relief functions and water quality functions. These lagoons are very important to the health and well being of the coastal habitats and species.

The smaller drainages would also be affected. Although these smaller drainages do not present the high quality habitat that the lagoons and San Luis Rey River provide, the build alternatives would result in placing several of these small wetlands and other waters of the U.S. into culverts eliminating any potential for wildlife habitat, flood control, or water quality functions. Drainages feeding into Cottonwood Creek, Encina Creek, and those parallel to I-5, north of Genesee Avenue would have portions placed into culverts.

Table 3.18.1: Permanent and Temporary Impacts to ACOE Jurisdictional Waters of the U.S.

	10+4 Barrier		10+4 Buffer		8+4 Barrier		8+4 Buffer	
	Ha	Ac	Ha	Ac	Ha	Ac	Ha	Ac
Permanent								
other waters U.S.	5.25	12.95	4.78	11.82	5.18	12.79	4.28	10.58
wetland	6.44	15.90	5.29	13.07	5.65	13.95	5.01	12.39
Total	11.68	28.86	10.07	24.89	10.83	26.74	9.29	22.97
Temporary								
other waters U.S.	1.74	4.30	1.80	4.46	1.77	4.38	1.92	4.74
wetland	3.74	9.25	4.70	11.60	4.53	11.20	3.68	9.10
Total	5.48	13.55	6.50	16.06	6.30	15.58	5.60	13.84

During the NEPA 404 meetings with the MOU resource agencies, the ACOE has expressed an interest in disclosing the amount of impacts to jurisdictional habitat by watershed. The permanent impacts by watershed are listed in *Table 3.18.2*. There is little difference in the amount of impacts for each of the alternatives in many of the watersheds. The footprint is the same in the San Clemente, Los Peñasquitos, Loma Alta, and San Luis Rey watersheds (*Table 3.18.2*). The greatest lagoon impacts are to Agua Hedionda and Batiquitos due to the existing narrow fill slopes under the current I-5 alignment and the closer proximity of waters of the U.S. to the roadway (*Table 3.18.2*). As with the totals, 8+4 with Buffer has the fewest permanent impacts to ACOE jurisdictional waters of the U.S. in each watershed with the

exception of wetlands impacted in San Dieguito; where the 8+4 with Barrier alternative has 0.08 ha (0.18 ac) less impact than 8+4 with Buffer. This discrepancy is likely due to a slightly different configuration of the lanes in this area.

Table 3.18.2: Permanent Impacts to ACOE Jurisdictional Waters of the U.S. by Watershed

		10+4 w/ Barrier		10+4 w/ Buffer		8+4 w/ Barrier		8+4 w/ Buffer	
Watershed	**Type**	**Ha**	**Ac**	**Ha**	**Ac**	**Ha**	**Ac**	**Ha**	**Ac**
San Clemente	other waters	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Wetland	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Los Peñasquitos	other waters	0.87	2.14	0.87	2.14	0.87	2.14	0.87	2.14
	Wetland	0.89	2.20	0.89	2.20	0.89	2.20	0.89	2.20
San Dieguito	other waters	0.47	1.17	0.44	1.09	0.46	1.13	0.43	1.05
	Wetland	1.27	3.14	1.06	2.61	0.92	2.28	1.00	2.46
San Elijo	other waters	0.28	0.70	0.26	0.64	0.27	0.66	0.24	0.60
	Wetland	0.96	2.37	0.63	1.55	0.70	1.74	0.48	1.18
Cottonwood Creek	other waters	0.01	0.04	0.01	0.03	0.01	0.03	0.01	0.03
	Wetland	0.15	0.38	0.11	0.27	0.09	0.23	0.10	0.26
Batiquitos	other waters	0.45	1.11	0.42	1.05	0.49	1.21	0.39	0.97
	Wetland	2.05	5.06	1.50	3.71	1.95	4.81	1.46	3.60
Encina	other waters	0.05	0.13	0.04	0.10	0.04	0.11	0.03	0.08
	Wetland	0.60	1.49	0.59	1.46	0.58	1.44	0.57	1.42
Agua Hedionda	other waters	2.54	6.28	2.17	5.36	2.48	6.12	1.75	4.32
	Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Buena Vista	other waters	0.12	0.30	0.12	0.30	0.12	0.30	0.12	0.30
	Wetland	0.23	0.57	0.23	0.57	0.23	0.57	0.23	0.57
Loma Alta	other waters	0.10	0.26	0.10	0.26	0.10	0.26	0.10	0.26
	Wetland	0.01	0.03	0.01	0.03	0.01	0.03	0.01	0.03
San Luis Rey	other waters	0.34	0.84	0.34	0.84	0.34	0.84	0.34	0.84
	Wetland	0.26	0.65	0.26	0.65	0.26	0.65	0.26	0.65
Total	**All**	**11.68**	**28.86**	**10.07**	**24.89**	**10.83**	**26.74**	**9.29**	**22.97**
	other waters	5.24	12.95	4.78	11.82	5.18	12.79	4.28	10.58
	Wetland	6.44	15.90	5.29	13.07	5.65	13.95	5.01	12.39

10+4 with Barrier

The 10+4 with Barrier alternative would have the most permanent impacts to ACOE jurisdictional waters of the U.S. The 10+4 with Barrier alternative would impact 11.68 ha (28.86 ac) of waters of the U.S. (*Table 3.18.1*). Almost half of the permanent impacts to jurisdictional waters of the U.S. would occur in Batiquitos and Agua Hedionda Lagoons (*Table 3.18.2*). The 10+4 with Barrier alternative would temporarily impact 5.48 ha (13.55 ac) of jurisdictional waters of the U.S. (*Table 3.18.1*).

10+4 with Buffer

The 10+4 with Buffer alternative would permanently impact 4.78 ha (11.82 ac) of jurisdictional wetlands and 5.29 ha (13.07 ac) of other waters of the U.S (*Table 3.18.1*). The largest impacts are within the Batiquitos and Agua Hedionda watersheds; however, the majority of the Batiquitos impacts are to wetlands, while the majority of the impacts to Agua Hedionda are to other waters of the U.S. (*Table 3.18.2*).

The 10+4 with Buffer would have a total of 6.5 ha (16.06 ac) of temporary impacts to ACOE jurisdictional waters associated with construction (*Table 3.18.1*).

8+4 with Barrier

The 8+4 with Barrier alternative would permanently impact 10.83 ha (26.74 ac) of ACOE jurisdictional waters of the U.S.(*Table 3.18.1*). Of the total permanent impacts from the 8+4 with Barrier alternative 5.18 ha (12.79 ac) are to other waters of the U.S. and 5.65 ha (13.95 ac) are to wetlands. The majority of the wetland impacts are to the Batiquitos watershed and the majority of the other waters of the U.S. impacts are to the Agua Hedionda watershed (*Table 3.18.2*). The 8+4 with Barrier alternative would temporarily impact 1.77 ha (4.38 ac) of other waters of the U.S. and 4.53 ha (11.20 ac) of wetlands (*Table 3.18.1*).

8+4 with Buffer

Of the ACOE jurisdictional waters of the U.S., the 8+4 with Buffer would permanently impact 5.01 ha (12.39 ac) of wetlands and 4.28 ha (10.58 ac) of non-wetland waters of the U.S. or other waters of the U.S.(*Table 3.18.1*). Temporary impacts to ACOE waters of the U.S. total 5.6 ha (13.84 ac) for the 8+4 with Buffer.

No Build

The No Build Alternative would not have any permanent impacts on the majority of these waters of the U.S. Some of the projects proposed to go forward with under the no build scenario would impact some of the wetlands to a much lesser extent. In addition, some culvert maintenance projects on existing culverts may be anticipated overtime that would at least have some temporary impacts on wetlands. Without this project that would replace the existing I-5 bridges, there is no option to lengthen bridges, remove some fill, or to enhance flow in the lagoons.

3.18.4 Avoidance, Minimization and/or Mitigation Measures

Impacts to wetlands have been minimized to the extent practicable. All impacts to wetlands could not be avoided due to the existing alignment crossing six lagoons and a river. The following conservation measures are proposed to minimize impacts to wetlands. Compensatory mitigation is discussed in *Section 3.21*.

- All debris from the replacement of old bridges or construction of new bridges would be contained, so that it does not fall into rivers and lagoons.
- Appropriate best management practices (BMP) would be used to control erosion and sedimentation. No sediment or debris would be allowed to enter the creeks, rivers, or lagoons.
- Bioswales and detention basins would be placed throughout the project limits to filter runoff prior to reaching wetlands and other waters of the U.S.
- Fueling of construction equipment would occur at a designated area at a distance greater than 30 m (98.4 ft) from drainages/lagoons, and associated plant communities to preclude adverse water quality impacts. Fuel cans and fueling of equipment would take place outside the drainages.
- Studies underway to determine if water flow under lagoon bridges could be enhanced with design changes to the bridges.

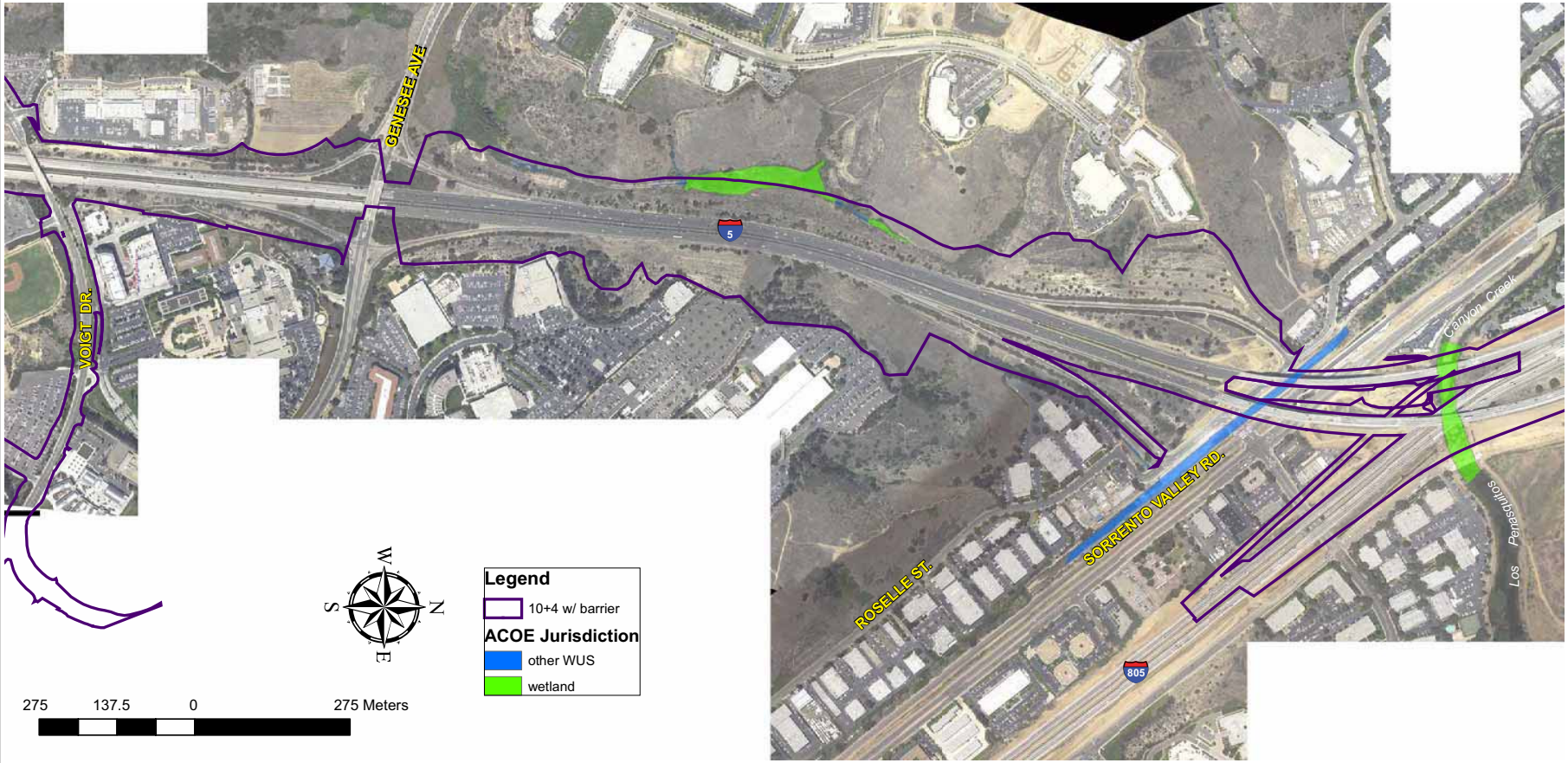


Figure 3-18.1a ACOE Jurisdictional Waters

250 125 0 250 Meters

W S E N

Legend

10+4 w/ barrier

ACOE Jurisdiction

other WUS

wetland

Figure 3-18.1b ACOE Jurisdictional Waters

Figure 3-18.1c ACOE Jurisdictional Waters

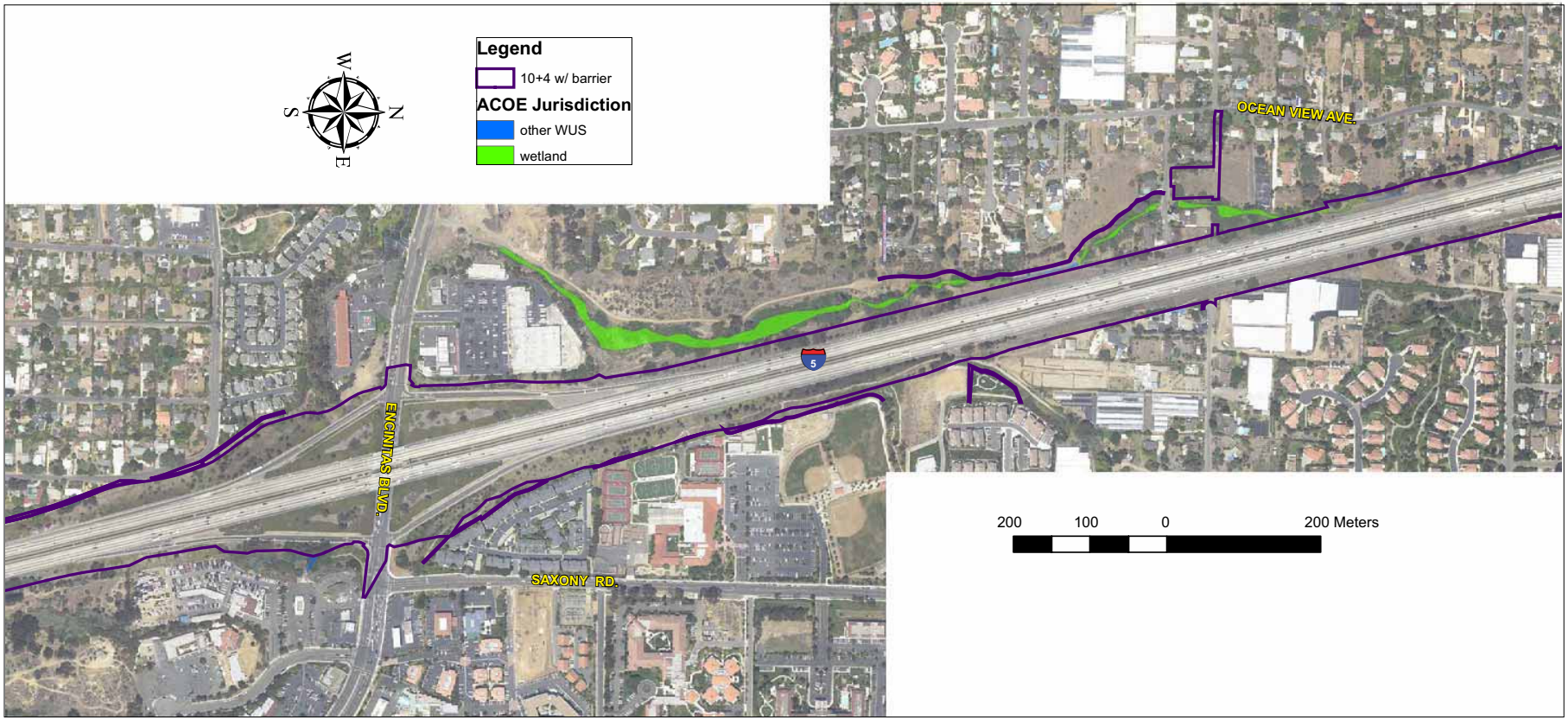


Figure 3-18.1d ACOE Jurisdictional Waters

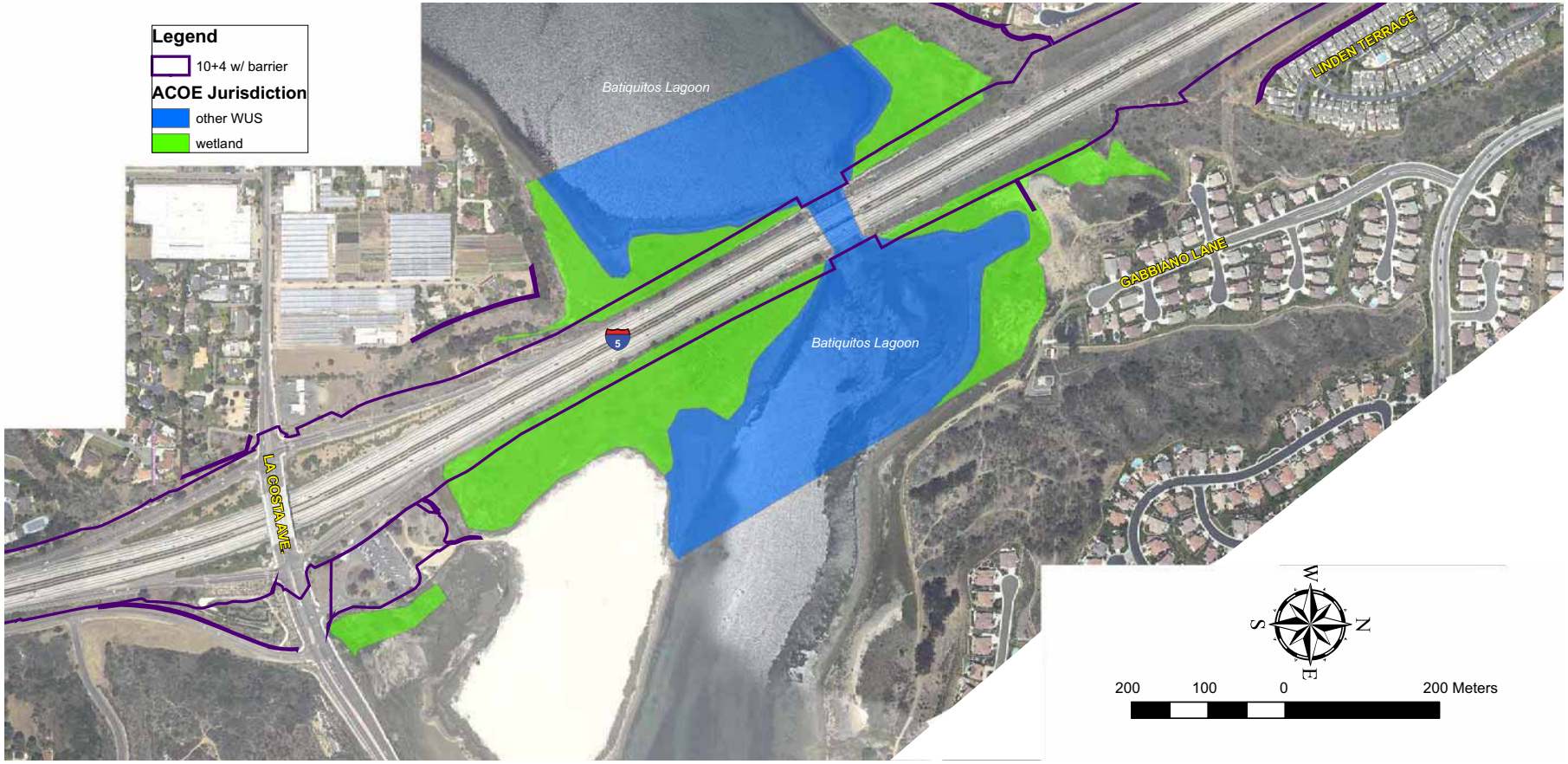


Figure 3-18.1e ACOE Jurisdictional Waters

Figure 3-18.1f ACOE Jurisdictional Waters

Figure 3-18.1g ACOE Jurisdictional Waters

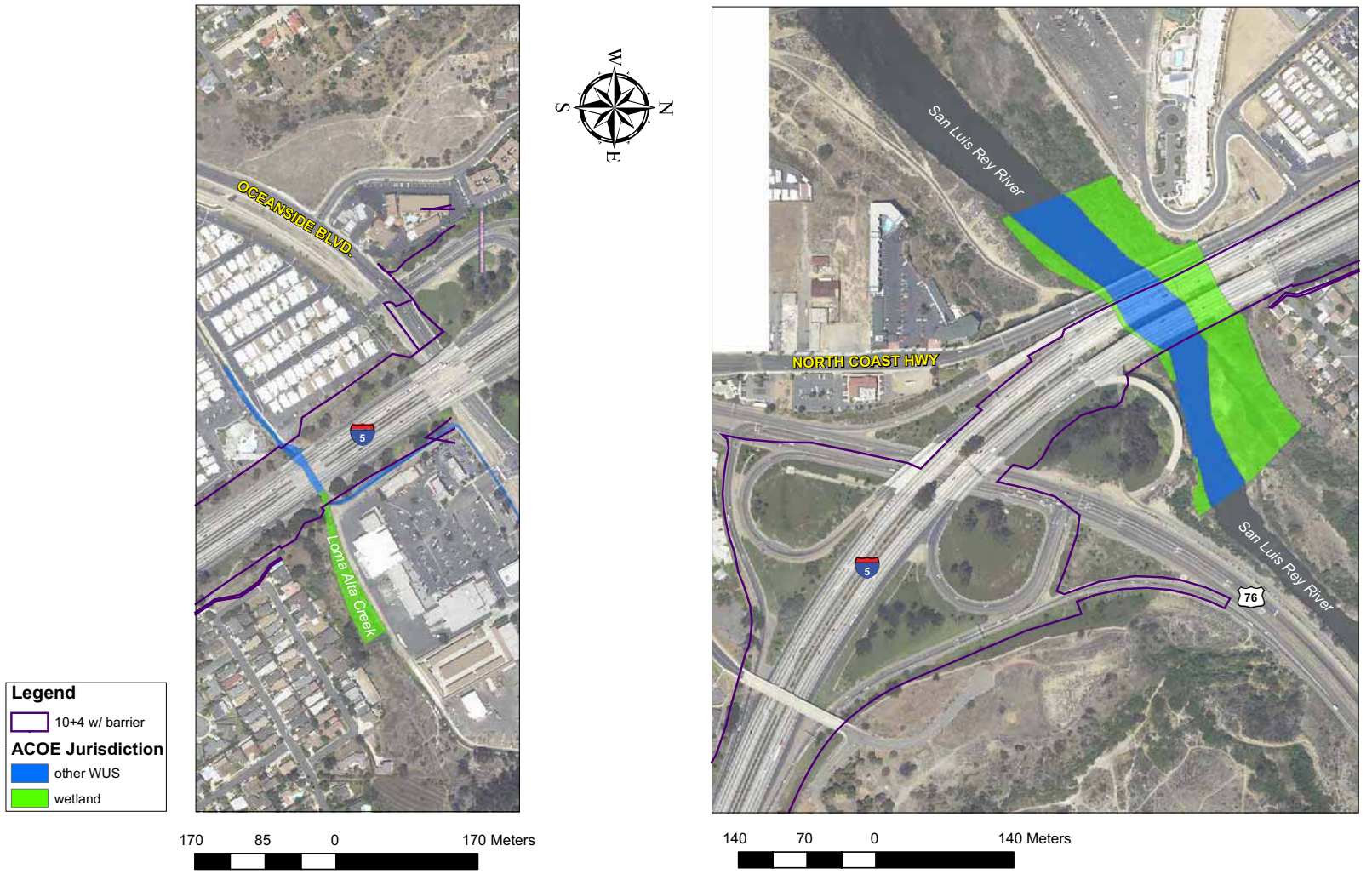


Figure 3-18.1h ACOE Jurisdictional Waters

3.19 Plant Species

3.19.1 Regulatory Setting

The U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Game (CDFG) share regulatory responsibility for the protection of special-status plant species. "Special-status" species are selected for protection because they are rare and/or subject to population and habitat declines. Special status is a general term for species that are afforded varying levels of regulatory protection. The highest level of protection is given to threatened and endangered species; these are species that are formally listed or proposed for listing as endangered or threatened under FESA and/or the California Endangered Species Act (CESA). Please see *Section 3.21 Threatened and Endangered Species,* in this document for detailed information regarding these species.

This section of the document discusses all the other special-status plant species, including CDFG species of special concern, USFWS candidate species, and non-listed California Native Plant Society (CNPS) rare and endangered plants.

The regulatory requirements for FESA can be found at United States Code (USC) 16, Section 1531, et. seq. See also 50 CFR Part 402. The regulatory requirements for CESA can be found at California Fish and Game Code, Section 2050, et. seq. Department projects are also subject to the Native Plant Protection Act, found at Fish and Game Code, Section 1900-1913, and the CEQA, Public Resources Code (PRC), Sections 2100-21177.

3.19.2 Affected Environment

The section is based upon the *NES (July 2007),* and *Manchester Avenue/Interstate 5 Interchange Project NES Report (January 2004)*, which are incorporated by reference. Sensitive plant species with the potential to occur in the Study Area, but that were not observed are described in the NES. The section below discusses sensitive plant species observed within the Study Area, these species are shown on *Figures 3-19.1a through 3-19.1e)*.

Adolphia californica Wats — CNPS List 2
California adolphia
Rhamnaceae (buckthorn family)

The California adolphia is a deciduous shrub that occurs in chaparral, coastal sage scrub, and in clay soils in valley and foothill grasslands. It flowers from December through April and is being affected by development and grazing. Adolphia was found on both sides of the slopes of I-5 near San Elijo Lagoon (*Figures 3-19.1a through 3-19.1e)*.

Atriplex pacifica Nelson — CNPS List 1B
south coast saltscale
Chenopodieae (goosefoot family)

South coast saltscale is a rare plant found in coastal southern California and the Channel Islands between 0 and 140 m (0 and 450 ft) elevation. This species occurs in coastal bluff scrub, playas, coastal sage scrub, and coastal sand dunes. It is an annual herbaceous species that blooms from March through October. Approximately 100 individuals were observed along a dirt road northwest of the I-5 Manchester interchange (*Figures 3-19.1a through 3-19.1e*).

Centromadia parryi (E. Greene) spp. *australis* (Keck) B.G. Baldwin — CNPS List 1B
southern tarplant
Asteraceae (sunflower family)

Southern tarplant is a rare plant found on the margins of marshes, grasslands, and vernal pools. It blooms from May to November. This species is threatened by development. Southern tarplant occurs along the dirt access road east of I-5 and north of the San Dieguito River (*Figures 3-19.1 through 3-19.5*).

Chaenactis glabriuscula DC var. *orcuttiana* (E. Greene) H.M. Hall — CNPS List 1B
Orcutt's pincushion
Asteraceae (sunflower family)

Orcutt's pincushion is a rare, annual herb that is found in coastal dunes and coastal bluff scrub between three and 100 m elevation (10 and 328 ft). This species occurs in coastal southern California and is threatened by coastal development. Approximately 4,700 individuals were observed within the Study Area around San Elijo Lagoon on both sides of I-5 (*Figures 3-19.1a through 3-19.1e).*

Comarostaphylis diversiloba (Parry) Greene ssp. *diversiloba* — CNPS List 1B
summer holly
Ericaceae (heath family)

Summer holly is an evergreen shrub found in chaparral communities from Orange County to Baja California. It flowers April through June. It is threatened by development and gravel mining. Summer holly was observed south of San Elijo Lagoon on the southbound slopes of I-5 (*Figures 3-19.1a through 3-19.1e*).

Coreopsis maritima (Nutt.) Hook.f — CNPS List 2
sea dahlia
Asteraceae (sunflower family)

Sea dahlia is a perennial herbaceous plant found in coastal bluff scrub and coastal sage scrub in San Diego County and Baja California. This species is considered rare and threatened by coastal development. It flowers between March and May. Approximately 389 individual sea dahlia plants were observed in the Study Area primarily north of Manchester Avenue on both sides of I-5 (*Figures 3-19.1a through 3-19.1e*).

Ferocactus viridescens (T. & G.) Britt. & Rose — CNPS List 2
San Diego barrel cactus
Cactaceae (cactus family)

The San Diego barrel cactus is found in chaparral, coastal sage scrub, valley and foothill grasslands and in areas around vernal pools. It is a stem succulent scrub that flowers from May through June. It is seriously threatened by urbanization, off-road vehicles, and horticultural collecting. San Diego barrel cactus were found on the slopes northwest of the I-5/Genesee interchange, on the slopes on both sides of I-5 near San Elijo Lagoon, and west of I-5 on the northern slopes of Batiquitos Lagoon (*Figures 3-19.1a through 3-19.1e*).

Lessingia filaginifolia var. linifolia Hall *CNPS List 1B*
Del Mar Mesa sand aster
Asteraceae (sunflower family)

This plant is endemic to San Diego County, and is generally associated with coastal sage scrub or chaparral on sandstone substrates. This species is found between Carlsbad and San Diego Bay on the coast. Del Mar sand aster was proposed for federal listing as threatened (58 Federal Register 51302), but the proposed rule was withdrawn based on information indicating that this species is no longer recognized as taxonomically distinct (61 Federal Register 52402 . Regardless of the current taxonomic treatment, the CNPS still designates it as rare, threatened, or endangered. Over 2,000 individuals were observed within the Study Area between Del Mar Heights Road and Birmingham Avenue Exit along the upper slopes on both sides of I-5 (*Figures 3-19.1a through 3-19.1e*).

Pinus torreyana Carr. ssp. *torreyana* CNPS List 1B Torrey pine
Pinaceae (pine family)

The Torrey pine is an evergreen tree found in sandstone soils in coastal coniferous forest, and chaparral communities in San Diego County. It is in cultivation; native plants probably number less than 9000. It is threatened by development. There are planted Torrey pines along much of the I-5. Some of the Torrey pines near San Elijo Lagoon may be native occurrences (*Figures 3-19.1a through 3-19.1e*).

Quercus dumosa Nutt. CNPS List 1B
Nuttall's scrub oak
Fagaceae (oak family)

The species occurs sporadically in coastal chaparral and sage scrub communities with a relatively open canopy. This species is considered to have a limited number and is restricted to coastal California communities. Nuttall's scrub oak is considered rare within the region by the CNPS. In the Study Area, several plants were observed at the top of the north and southbound slopes, just north of Del Mar Heights Road and on the upper slopes near San Elijo Lagoon (*Figures 3-19.1a through 3-19.1e*).

Suaeda esteroa W. Ferren & S. Whitmore CNPS List 1B
Estuary seablite
Chenodiaceae (goosefoot family)

Estuary seablite occurs from Santa Barbara County south to Baja California. It is found in coastal salt marshes and blooms from July through October. This species was found in the high salt marsh around San Dieguito, Batiquitos, and Agua Hedionda Lagoons.

3.19.3 Environmental Consequences

Each of the build alternatives would have similar impacts to sensitive plant species. Several individuals of different sensitive species listed by the CNPS and/or federal or state species of concern would be impacted by each of the build alternatives. Del Mar sand aster, coastal scrub oak, Orcutt's pincushion, sea dahlia, wart-stemmed ceanothus, coast barrel cactus, southern tarplant, and torrey pine would be impacted by each of the alternatives (*Table 3.19.1*).

Table 3.19.1: Sensitive Plant Species Impacted by Each Alternative

Species	10+4 w/ Barrier	10+4 w/ Buffer	8+4 w/ Barrier	8+4 w/ Buffer
San Diego barrel cactus	9	0	9	3
Nuttall's scrub oak	5	5	5	6
Del Mar sand aster	519	471	471	466
Orcutt's pincushion	1312	1222	979	652
Sea dahlia	18	18	19	17
Southern tarplant	10	10	10	10
Torrey pine	3	3	4	3
Wart-stemmed ceanothus	10	4	0	0

Due to the varying amounts of fill and exact alignment of each alternative, the numbers of sensitive plants differs for each of the alternatives, not necessarily in reference to the amount of habitat impacted. Other than large numbers of Del Mar sand aster and Orcutt's pincushion, impacts to other sensitive plants are few. The majority of these species could potentially be salvaged or mitigated by planting in an offsite preserve. Del Mar sand aster seed was successfully collected for the Del Mar Auxiliary Lane project and reseeded on the mitigation site.

There would be no impacts to sensitive plants from the no build alternative.

3.19.4 Avoidance, Minimization and/or Mitigation Measures

Seed would be collected or plants would be salvaged to the extent practicable in the impact areas. Salvaged plants and seed would be planted in mitigation sites, on revegetated new slopes, or in revegetated areas that were temporarily impacted.

Compensatory mitigation measures for all species and habitats are discussed in *Section 3.21 Threatened and Endangered Species*.

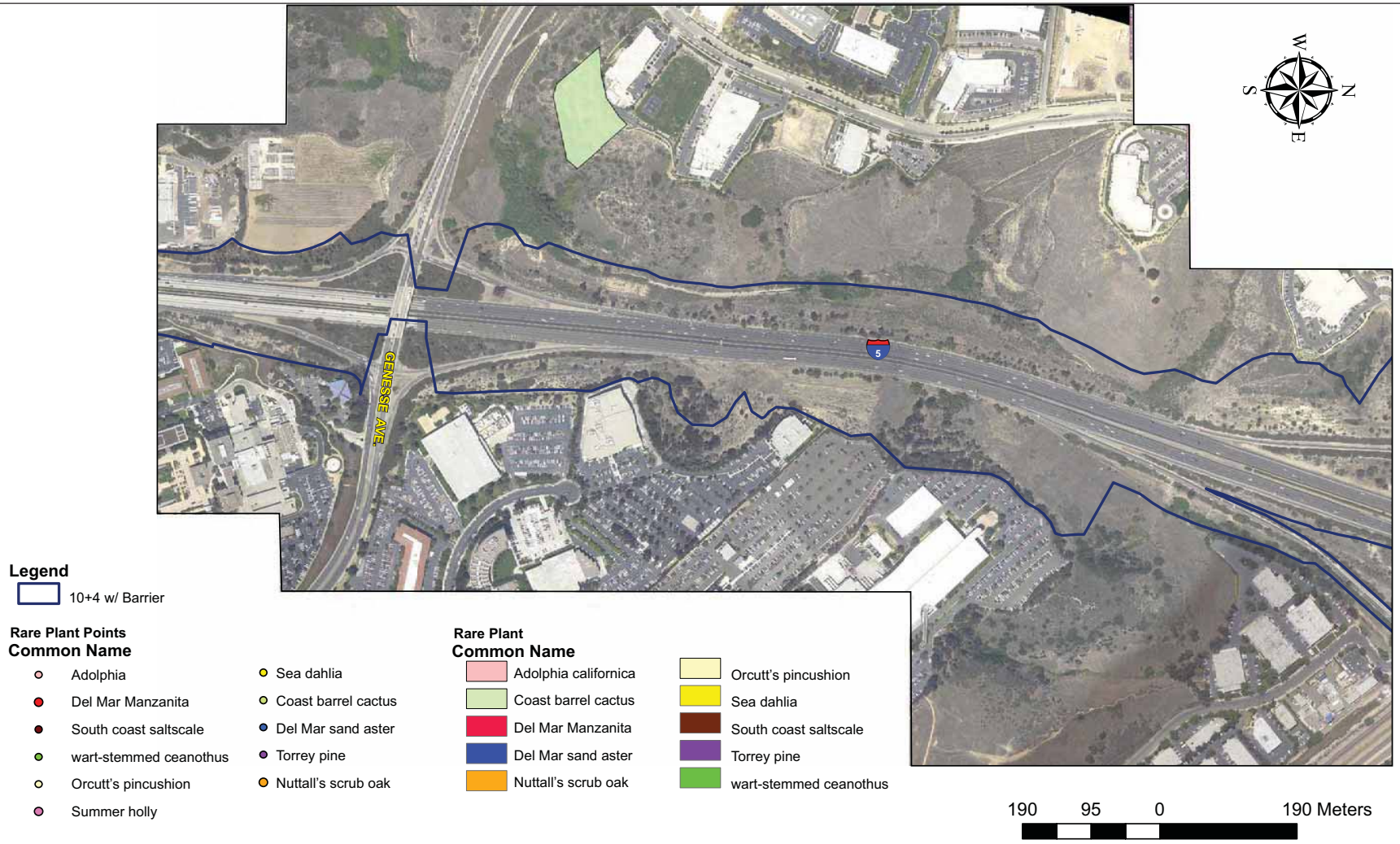


Figure 3-19.1a Sensitive Plant Locations

Figure 3-19.1b Sensitive Plant Locations

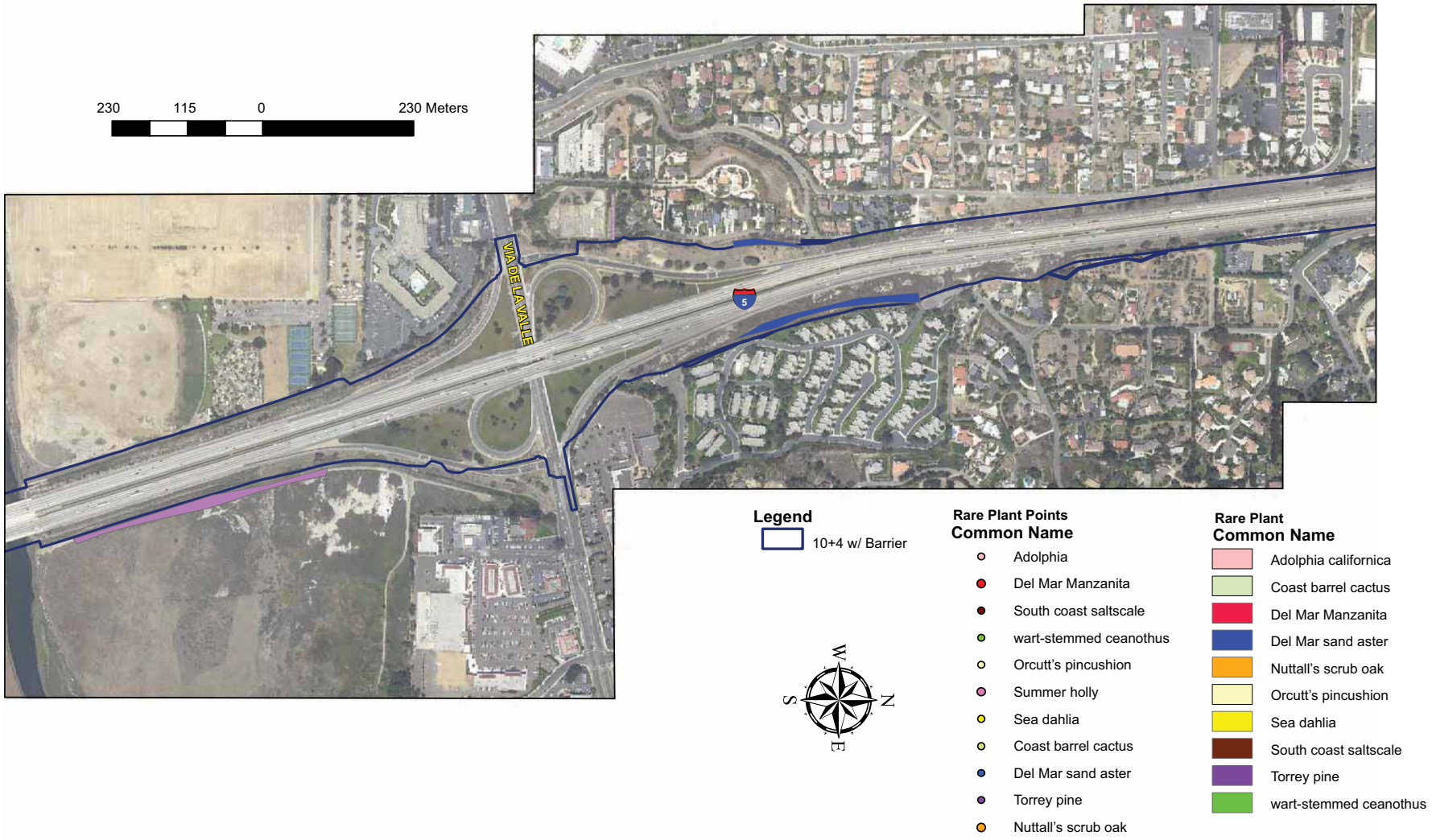


Figure 3-19.1c Sensitive Plant Locations

Figure 3-19.1d Sensitive Plant Locations

Figure 3-19.1e Sensitive Plant Locations

3.20 Animal Species

3.20.1 Regulatory Setting

Many laws regulate impacts to wildlife. The USFWS, NOAA and the CDFG are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with wildlife that are not listed or proposed for listing under CESA or FESA. Species listed or proposed for listing as threatened or endangered are discussed in *Section 3-21* below. All other special-status animal species are discussed here, including CDFG fully protected species and species of special concern, and USFWS or NOAA Fisheries candidate species.

Federal laws and regulations pertaining to wildlife include the following:

- National Environmental Policy Act
- Migratory Bird Treaty Act
- Fish and Wildlife Coordination Act
- Marine Mammal Protection Act
- Magnuson-Stevens Fishery Conservation and Management Act

State laws and regulations pertaining to wildlife include the following:

- California Environmental Quality Act
- Sections 1601 – 1603 of the Fish and Game Code
- Section 4150 and 4152 of the Fish and Game Code
- Section 3511 of the Fish and Game Code

Essential Fish Habitat (EFH) is identified in the Magnuson-Stevens Fishery Conservation and Management Act as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." EFH has been identified for four groups of fish; Pacific salmon, Pacific groundfish, coastal pelagic species, and highly migratory species. The Pacific salmon group does not include steelhead, which is protected. The coastal pelagic group is the only EFH group within the I-5 Study Area. The coastal pelagic species group includes northern anchovy (*Engraulis mordax*), Pacific sardine (*Sardinops sagax*), Pacific mackerel (*Scomber japonicus*), and the jack mackerel (*Trachurus symmetricus*).

3.20.2 Affected Environment

The section is based upon the *NES (July 2007), Manchester Avenue/Interstate 5 Interchange Project NES Report (January 2004), I-5 Widening Project Pacific Pocket Mouse Habitat Analysis and Trapping Program San Diego County, California (June 2003), and I-5 Lagoons Marine Resource Investigation (June 2006)*, which are incorporated by reference. Sensitive animal species with the potential to occur in the Study Area, but that were not observed are described in the NES. The section below discusses sensitive wildlife species observed within the Study Area, these species are shown on *Figures 3-20.1a through 3-20.1e*.

Due to the length of the project and the fact that it crosses six lagoons and a major river resulted in a large number of sensitive non-listed wildlife species observed within the Study Area. Many of the bird species that stop at the lagoons during their migration have some sensitivity status, primarily in their breeding grounds, and virtually all species of birds observed in the Study Area are considered migratory.

The white-tailed kite (*Elanus caeruleus*), a California Fully Protected (CFP) Species and Species of Special Concern (SSC), was occasionally observed foraging over the Study Area, usually over the agricultural fields. No nest sites were observed or are known to exist within the Study Area.

Not all sightings were mapped, as herons, egrets, and many of the raptors were commonly observed in the Study Area (*Figures 3-20.1a – 3.20.1h*). Most of these species were found in and around the lagoon and associated upland habitats.

3.20.3 Environmental Consequences

Many of the sensitive animal species observed within the lagoons and upland habitats likely occur more frequently than observed. Any impacts to coastal sage scrub, southern maritime chaparral and/or maritime succulent scrub have the potential to impact the San Diego horned lizard (*Phrynosoma coronatum blainvillei)*, Coronado Island skink (*Eumeces skiltonianus interparietalis)*, orange-throated whiptail (*Cnemidophorus hyperythrus)*, rufous-crowned sparrow (*Aimophila ruficeps canescens)*, raptors, loggerhead shrike (*Lanius ludovicianus)*, desert woodrat (*Neotoma lepida intermedia)*, and San Diego pocket mouse (*Perognathus fallax fallax)*. The point location where the rufous-crowned sparrow was observed falls within the permanent impact footprint for all four build alternatives. Two locations of San Diego pocket mouse near San Elijo Lagoon would be impacted by all of the build alternatives.

The least bittern was observed in the drainage parallel to I-5 near San Dieguito Lagoon. This area is within the permanent impact footprint for all four build alternatives.

Many bird species that migrate along the Pacific flyway use the lagoons to stop over and forage. Several of these bird species are considered sensitive at their breeding grounds, but not necessarily along their migration routes including the white pelican, long-billed curlew, and double crested cormorant. Construction for any of the build alternatives for I-5 would result in an incremental loss of foraging habitat along the freeways; however, it would not impact these birds nesting grounds.

Although no bat species were observed or detected within the project limits there is a potential that some species may sporadically use the lagoon bridges.

Several projects that may go forward under the no build alternative may have impacts to habitats that may support some of these sensitive animal species.

Table 3.20.1: Sensitive Animal Species Observed within the Study Area

Scientific Name	Common Name	Status	General Habitat Description	Rationale
Phrynosoma coronatum blainvillei	San Diego horned lizard	SSC	Prefers friable, rocky, or shallow sandy soils in coastal sage scrub, and chaparral in arid and semiarid climates.	At least one individual caught near Del Mar Heights Road during small mammal trapping. More likely to occur within the SA.
Eumeces skiltonianus interparietalis	Coronado Island skink	SSC	Prefers mesic pockets within habitats including coastal sage scrub, chaparral, oak woodlands, pinon-juniper, and riparian woodlands.	At least one individual observed at southern end of Study Area near the 5/805 merge. Others potentially throughout the SA.
Cnemidophorus hyperythrus	Orange-throated whiptail	SSC, SP	Prefers washes and other sandy areas with patches of brush and rocks for cover. Habitats include low-elevation coastal sage scrub, chaparral, and valley-foothill hardwood forests.	Observed during general wildlife surveys in coastal sage scrub .
Thamnophis hammondii	Two-striped garter snake	SSC	Occurs in or near permanent fresh water, usually along streams with rocky beds bordered by willow and other riparian vegetation.	Observed during general wildlife surveys near San Dieguito River.
Pelecanus erythrorhynchos	American white pelican	SSC	Inhabits lakes, ponds, and coastal waters.	Observed in San Elijo, Batiquitos, and Buena Vista lagoons during general wildlife surveys
Phalacrocorax auritus	Double-crested cormorant	SSC	Found near fresh and saltwater near coastline, inshore waters, beaches, inland rivers, and lakes.	Observed in lagoons during general wildlife surveys.
Ixobrychus exilis	Least bittern	SSC	Inhabits fresh and brackish water marshes, usually near open water sources, and desert riparian habitats.	Observed in San Dieguito and in San Elijo Lagoons.
Ardea herodias	Great blue heron	SSC	Found in fresh and saltwater emergent wetlands and estuaries. Less common along rivers, in croplands, pastures, and foothill ponds.	Observed in lagoons during general wildlife surveys. Some nesting habitat may be present at San Elijo Lagoon.
Casmerodius albus	Great egret	SSC	Common to freshwater and saltwater marshes, swampy woods, ponds, lagoons, estuaries, mangroves, streams, lakes, and ponds.	Observed in lagoons during general wildlife surveys
Pandion haliaetus	Osprey	SSC	Prefers the coast and lakes in the coastal lowlands and rarely lakes in the foothills and mountain areas.	Observed at Batiquitos and San Dieguito lagoons.
Elanus leucurus majusculus	White-tailed kite	FP	Inhabits riparian or oak woodland adjacent to grassland or open fields where it hunts rodents.	Observed at San Dieguito and San Elijo lagoons during general wildlife surveys.
Circus cyaneus	Northern harrier	SSC	Occurs throughout San Diego County in grasslands and agricultural fields during migration and in winter.	Observed at San Dieguito Lagoon.
Accipiter striatus	Sharp-shinned hawk	SSC	Occupies woodlands and a variety of habitats surrounding those wooded areas, and requires a certain amount of dense cover.	Observed during general wildlife surveys.
Accipiter cooperii	Cooper's hawk	SSC	Uncommon migrant and winter visitor to woodlands, parks, and residential areas.	Observed during general wildlife surveys.
Numenius americanus	Long-billed curlew	SSC	Can be found on sandy beaches on marine and estuarine shores, salt pond levees, and the shores of large alkali lakes. Requires sandy or gravelly soils for nesting.	Observed during general wildlife surveys feeding in mudflats within the lagoons.
Eremophila alpestris actia	California horned lark	SSC	Inhabits sandy ocean or bay shores, grasslands, and open scrublands and woodlands with low, sparse vegetation.	Present on revegetating slopes of the new Auxiliary lane on the northbound side of I-5, south of San Dieguito River.
Lanius ludovicianus	Loggerhead shrike	FSC, SSC	Inhabits agricultural lands, desert wash, desert scrub, grasslands, and beaches with scattered bushes. Requires open ground for foraging, preferably near scattered bushes and low trees that provide nest sites and perches.	Observed at the Racetrack View Mitigation Site west of I-5. High probability to occur in other areas based on historical location data and presence of suitable habitat within the SA.
Dendroica petechia	Yellow warbler	SSC	Occupies marshes, swamps, streamside groves, willow and alder thickets, open woodlands with thickets, and orchards.	Observed during general wildlife surveys in riparian areas.
Aimophila ruficeps canescens	Southern California rufous-crowned sparrow	SSC	Uncommon to fairly common localized resident of sage scrub on steep rocky slopes.	Observed during general wildlife surveys at San Dieguito Lagoon.
Perognathus fallax fallax	Northwestern San Diego pocket mouse	SSC	Habitats include coastal sage scrub, chaparral, oak woodlands, and annual grasslands.	Captured during trapping studies on the slopes south of San Dieguito Lagoon, and around San Elijo Lagoon.
Neotoma lepida intermedia	San Diego desert woodrat	SSC	Occupies rocky habitats in association with chaparral and coastal sage scrub.	Captured during trapping studies south of San Dieguito Lagoon.

[1]**Status Key**

FSC	Federal Species of Concern
FP	State of California fully protected
SP	State of California protected
SSC	State of California Species of Concern

Essential Fish Habitat

Although not captured during eelgrass and fish sampling in the lagoons; northern anchovy, Pacific sardine, and jack mackerel have a potential to occur in San Dieguito, San Elijo, Batiquitos, and Agua Hedionda Lagoons within the Study Area. They are most likely to occur in the open water at Batiquitos and Agua Hedionda Lagoons that are continuously open to the ocean. The open water in all these lagoons and potentially in the San Luis Rey River, provides EFH. Replacement and construction of the bridges in these lagoons and river may adversely affect EFH. The construction of new bridge pilings, fill placed along the abutments, and demolition of the bridges to be replaced could have direct impacts to EFH; the bridge footprints are identified as permanent impacts. Shading by the wider bridges may reduce some habitats used by fish such as eelgrass; however, columns, currents, and temperature changes under the bridges may be favored by some fish species. Increased runoff from the wider roadway could have indirect impacts to EFH. During construction of the bridges, false work and some kind of work platform may be used and this could have a temporary impact to EFH. All four build alternatives would have an impact to EFH. The no build alternative would not affect EFH.

3.20.4 Avoidance, Minimization and/or Mitigation Measures

To minimize impacts to nesting migratory bird species, all native vegetation and nonnative shrubs and trees within the impact areas would be removed outside of the breeding season (February 15 to August 31), if possible. Otherwise, a qualified biologist would thoroughly survey all vegetation prior to removal to ensure there are no nesting birds onsite. If nesting birds are identified onsite, vegetation removal would be delayed until the chicks have fledged or the nest has failed.

The lagoons are important stop over, resting, and foraging habitats for birds migrating along the Pacific flyway. To minimize impacts to migratory birds, construction would not occur in more than two lagoons at any one time.

Exclusion devices would be installed on bridge drain holes and ledges during the non-breeding season (September 1 through February 15) to stop swallows, swifts, and any other birds or bats from nesting on or within bridges to be demolished.

Measures listed under natural communities and wetlands and other waters of the U.S. concerning minimizing sediment entering the lagoon and habitat protection would minimize affects to EFH.

Conservation measures and compensatory mitigation for impacts to sensitive wildlife and habitats, including EFH, birds, and ESAs, are discussed in *Section 3.21.4*.

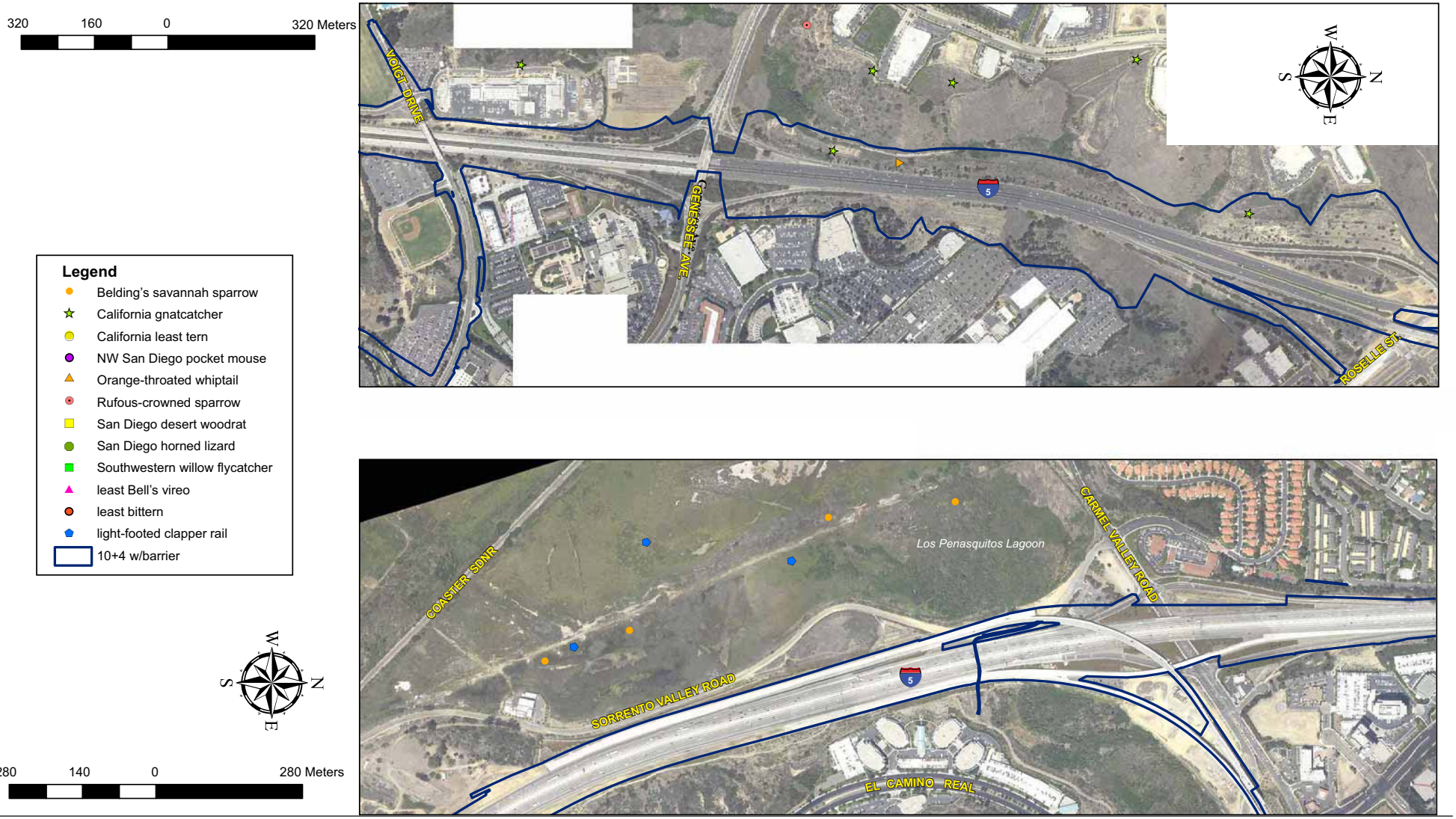


Figure 3-20.1a Sensitive Wildlife Locations

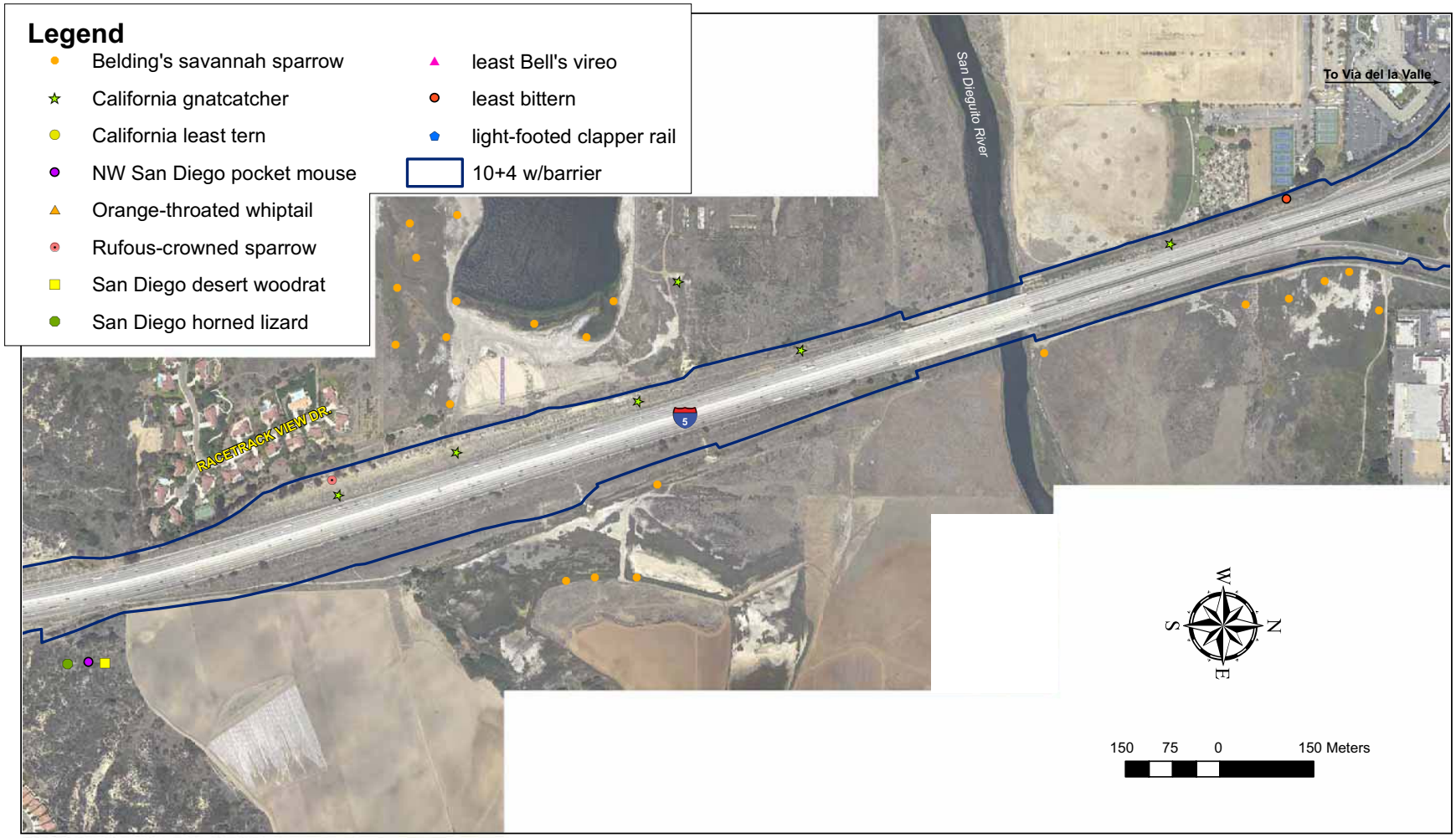


Figure 3-20.1b Sensitive Wildlife Locations

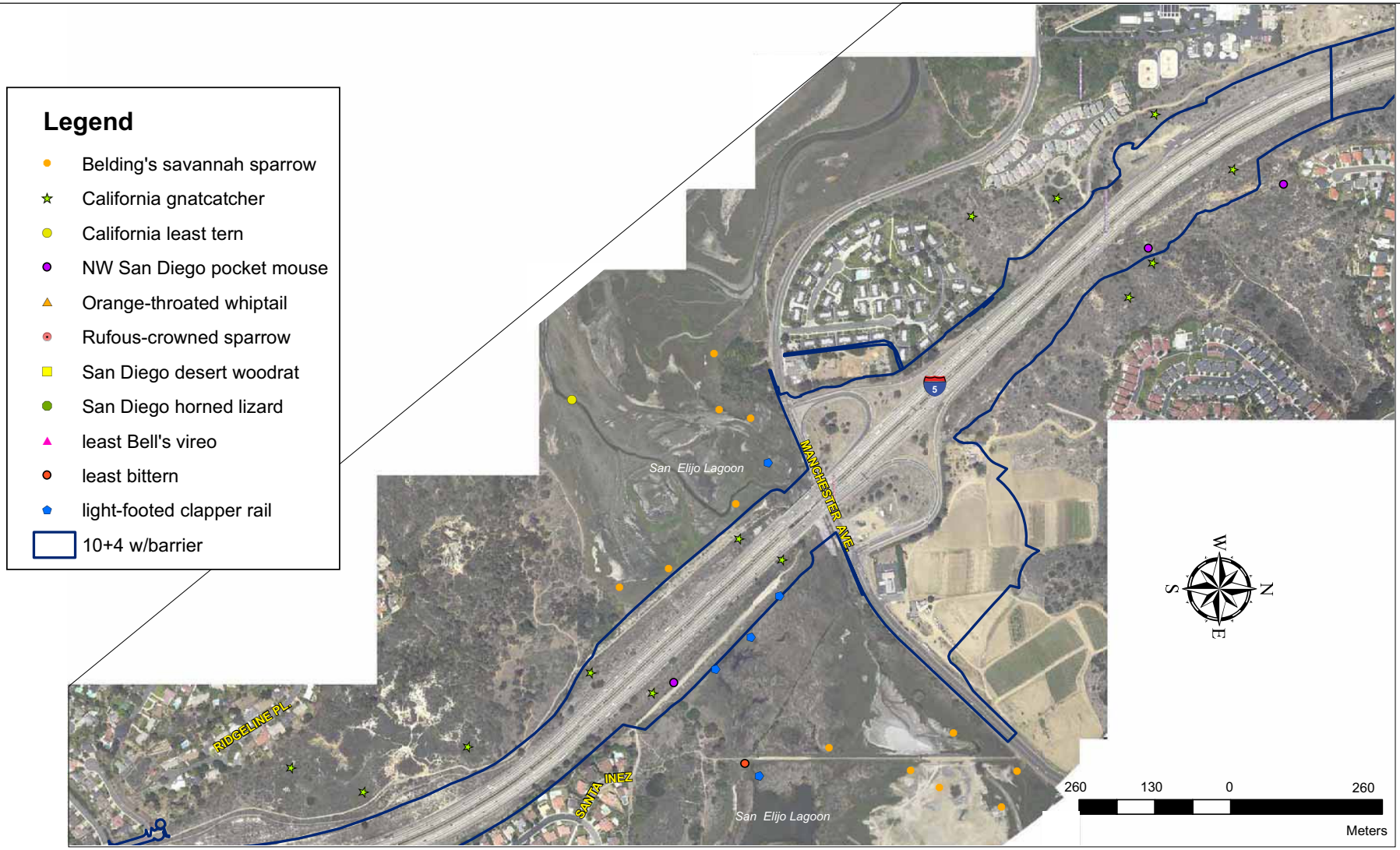


Figure 3-20.1c Sensitive Wildlife Locations

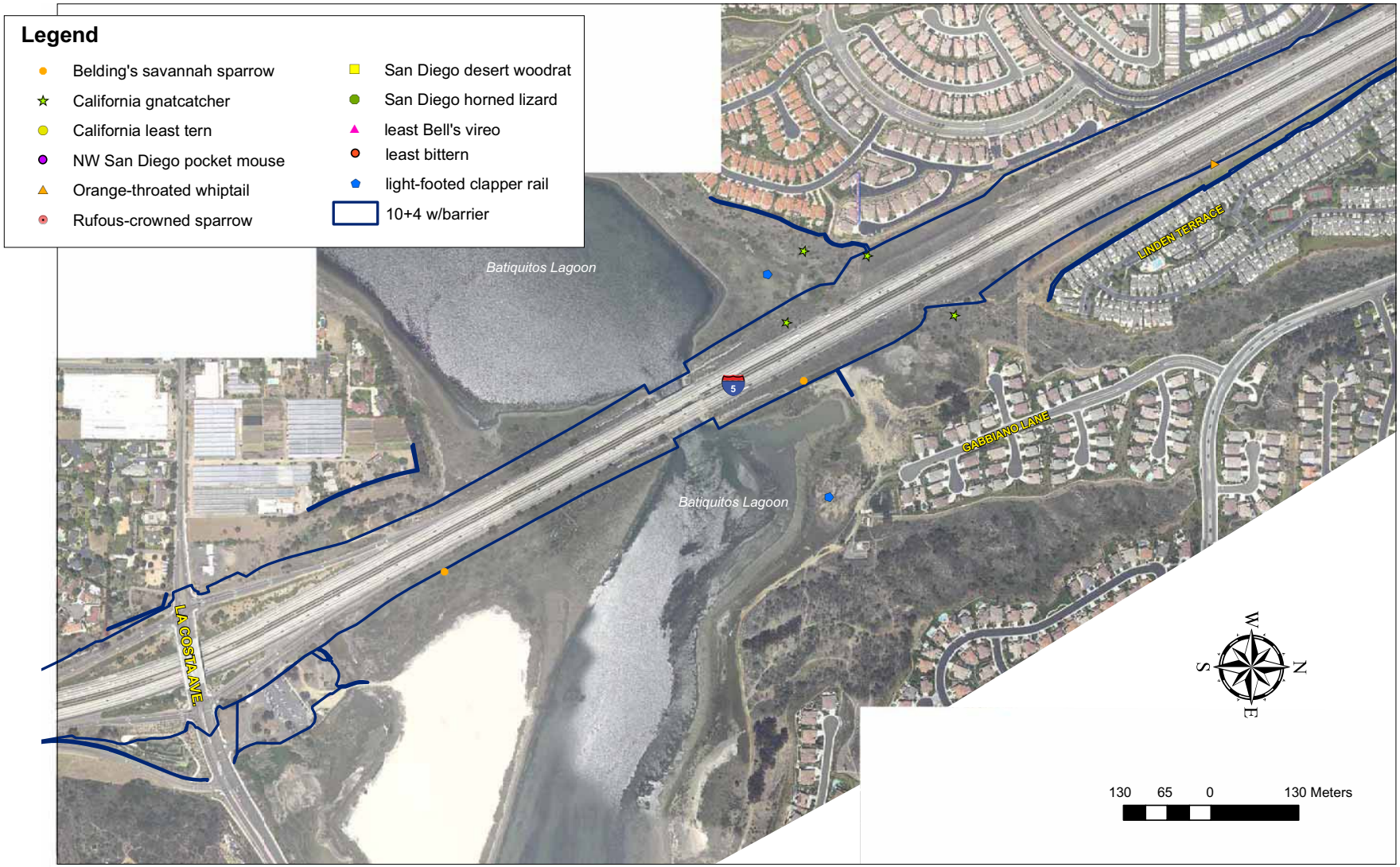


Figure 3-20.1d Sensitive Wildlife Locations

Figure 3-20.1e Sensitive Wildlife Locations

3.21 Threatened and Endangered Species

3.21.1 Regulatory Setting

The primary federal law protecting threatened and endangered species is FESA: 16 United States Code (USC), Section 1531, et seq. See also 50 CFR Part 402. This act and subsequent amendments provide for the conservation of endangered and threatened species and the ecosystems upon which they depend. Under Section 7 of this act, federal agencies, such as the FHWA, are required to consult with the USFWS and the NOAA/NMFS to ensure that they are not undertaking, funding, permitting or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Critical habitat is defined as geographic locations critical to the existence of a threatened or endangered species. The outcome of formal consultation under Section 7 is a Biological Opinion and an Incidental Take statement. Section 3 of FESA defines take as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or any attempt at such conduct."

California has enacted a similar law at the state level, CESA, California Fish and Game Code, Section 2050, et seq. CESA emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate planning to offset project caused losses of listed species populations and their essential habitats. The CDFG is the agency responsible for implementing CESA. Section 2081 of the Fish and Game Code prohibits "take" of any species determined to be an endangered species or a threatened species. Take is defined in Section 86 of the Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." CESA allows for take incidental to otherwise lawful development projects; for these actions an incidental take permit is issued by CDFG. For projects requiring a Biological Opinion under Section 7 of FESA, CDFG may also authorize impacts to CESA species by issuing a Consistency Determination under Section 2080.1 of the Fish and Game Code.

3.21.2 Affected Environment

The section is based upon the NES (July 2007), Manchester Avenue/Interstate 5 Interchange Project NES Report, I-5 Widening Project Pacific Pocket Mouse Habitat Analysis and Trapping Program San Diego County, California, I-5 Lagoons Marine Resource Investigation (June 2006), and the Noise Report for Sensitive Wildlife Receptors within the I-5 North Coast Project, which are incorporated by reference. The section below discusses listed threatened and endangered species observed within the Study Area. These species are shown on *Figures 3-20.1a through 3-20.1f.*

Arctostaphylos glandulosa ssp. *crassifolia* — FE
Del Mar Manzanita — CNPS List 1B
Ericaeae (heath family)

This plant is restricted to San Diego County and northern Baja California. This species is a fire-adapted shrub restricted to sandstone terraces and bluffs, and is associated with a subtype of chaparral known as southern maritime chaparral. About 25 populations exist in San Diego County, including nearby areas at Del Mar and the Torrey Pines State Reserve. Del Mar manzanita is a federally listed endangered species and is considered endangered by the CNPS. In the Study Area, approximately 70 plants were observed at the top of the slopes on both sides of I-5, just north of Del Mar Heights Road to Birmingham Drive (*Figure 3-19.1a – 3-19.1e*).

Ambrosia pumilla — FE
San Diego ambrosia — CNPS List 1B
Asteraceae (sunflower family)

The San Diego ambrosia is a rhizomatous perennial herb that flowers June through September. This species is federally listed as endangered. It is found in chaparral, coastal scrub, valley and foothill grassland, and vernal pool communities in coastal San Diego County, western Riverside County, and northern Baja California . It is often found in disturbed areas within these communities. Many occurrences within the San Diego County have been extirpated. This species is seriously threatened by development. No San Diego ambrosia was observed during any surveys conducted for the I-5 project, and there are no locations recorded in the CNDDB within the Study Area. The closest recorded occurrence of this species is 4 km (2.5 mi) east of I-5 along State Route 76 (SR-76).

Baccharis vanessae — FT/SE
Encinitas baccharis — CNPS List 1B
Asteraceae (sunflower family)

Encinitas baccharis is a perennial, broom-like, and dioecious shrub. This species is endemic to San Diego County, occurring locally in chaparral along the coast from Encinitas to Mira Mesa. This species is federally listed as threatened and state listed as endangered. This species was not observed and would have been identified if it occurred within the project area. The closest known occurrence is approximately 375 m (1230 ft) east of the I-5 near Encinitas Boulevard.

Brodiaea filifolia — FT/SE
thread-leaved brodiaea — CNPS List 1B
Liliaceae (lily family)

The thread-leaved brodiaea is a bulbiferous perennial herb found in coastal sage scrub, cismontane woodland, valley and foothill grasslands, and in clay soils in vernal pools. This species is federal and state listed as endangered. It is seriously threatened residential development, agriculture, and vehicles damaging plants. No thread-leaved brodiaea were observed during surveys conducted for the project. The closest known location is approximately three km (1.86 mi) east of I-5 near SR-78.

Eryngium aristulatum var. parishii — FE/SE
San Diego button celery — CNPS List 1B
Apiaceae (carrot family)

San Diego button-celery is an herbaceous annual or perennial plant. This species is federally listed as endangered and is state listed as endangered. This taxon is associated with clay bottom vernal pools. San Diego button-celery is found in Riverside and San Diego counties, and in Baja California, Mexico. In San Diego County, the species is found on Camp Pendleton, Carlsbad, San Marcos, Miramar Naval Air Station, Clairemont Mesa, and Otay Mesa. There are no vernal pools in the Study Area; therefore, the San Diego button celery is not expected to occur within the project limits.

Navarretia fossalis FT
Spreading navarretia CNPS List 1B
Polemoniaceae (phlox family)

Spreading navarretia is federally listed as threatened and is considered rare by the CNPS. It is a spring-blooming annual plant (April-June). This species typically occurs below 450 m (1475 ft) elevation. It is primarily found in vernal pools, although it occasionally occurs in ditches or other artificial depressions. Spreading navarretia occurs in western Riverside and southwestern San Diego counties, and in northwestern Baja California, Mexico. Historically, spreading navarretia occurred in relatively few of the San Diego County vernal pools. In San Diego County, this species is found in Carlsbad, San Marcos, Ramona, and Otay Mesa. It is not expected to occur in the Study Area due to a lack of suitable habitat.

Pogogyne abramsii FE/SE
San Diego mesa mint CNPS List 1B
Lamiaceae (mint family)

San Diego Mesa mint is an annual aromatic herb in the mint family. This species is federally listed as endangered and is state listed as endangered. San Diego Mesa mint is endemic to San Diego County. This spring-blooming (April-June) annual plant is restricted to vernal pools on mesa tops. Its distribution is centered on the mesas north of San Diego, including Miramar Naval Air Station, Tierrasanta, and Kearny Mesa. San Diego mesa mint is not expected to occur in the Study Area due to a lack of suitable habitat.

Pacific pocket mouse FE/SSC
Perognathus longimembris pacificus

The Pacific pocket mouse is a federal endangered species and a CDFG species of special concern. The Pacific pocket mouse is the smallest subspecies of the little pocket mouse (*Perognathus longimembris*) and one of the smallest rodents in the world. Its length from nose to tail can be up to 131 mm (5.24 in) and it weighs 7 to 9 grams (0.25 to 0.32 ounces). The Pacific pocket mouse is mostly brown (various shades of), free from bristles or spines, and whitish below. Body color varies within geographical locations. It is an endemic species to the southern California coast from Los Angeles County to near the Mexico-San Diego border. Its habitat requirements are fine-grain and sandy substrates in coastal sage scrub; however, in San Diego County they have also been found in open patches of ground surrounded by weeds.

Protocol live-trapping for the Pacific pocket mouse conducted for five nights was completed in five locations within the highest quality habitat near the San Dieguito and San Elijo Lagoons in 2003. No pocket mice were caught during the trapping effort. No pocket mice are expected to occur within the project limits.

Light-footed clapper rail FE/SE and CFP
Rallus longirostris levipes

The light-footed clapper rail occurred historically along the southern California coast from Santa Barbara County south to San Quintin, Baja California. Populations have declined due to limited distribution and destruction/degradation of coastal salt marsh habitat. About 253 pairs were reported in 2000, 90 percent of these were reported in just three wetland areas: Anaheim Bay and Newport Bay (Orange County) and Tijuana Estuary (San Diego County). Light-footed clapper rails are typically found in salt marshes dominated by cordgrass, but can also be found in habitats dominated by cattail (*Typha* spp.) and sedges (*Scirpus* spp.). Nesting occurs from mid-March to the beginning of July.

Focused surveys for the light-footed clapper rail were completed along the San Luis Rey River, Buena Vista Lagoon, Batiquitos Lagoon, San Elijo Lagoon, and San Dieguito Lagoon in 2003, and in Los Peñasquitos Lagoon in 2004 within 152 m (500 ft) of the existing I-5. Light-footed clapper rails were detected within 152 m (500 ft) of I-5 in Buena Vista and San Elijo Lagoons (*Figure 3-20.1a – 3-20.1e*). One pair was observed in the northwestern quadrant of Buena Vista Lagoon and a single and two more pairs were observed in 2003 further east of I-5. Two single males and one pair were detected in San Elijo Lagoon east of I-5 in the marsh adjacent to the I-5 fill slope. No clapper rails were observed in Los Peñasquitos Lagoon within 152 m (500 ft) of I-5. However, two pairs of rails and a single male rail were detected south of the survey area and north of the City of San Diego's pump station. In 2005, during separate surveys at Batiquitos Lagoon, clapper rails were observed adjacent to the park and ride at La Costa and on the north shore of the east basin.

California brown pelican FE/SE
Pelecanus occidentalis californicus

The California brown pelican was officially listed as endangered by the USFWS on October 13, 1970 and by CDFG on June 27, 1971. Brown pelicans occur in marine habitats along the Pacific, Atlantic, and Gulf coasts in North America and range south to Central and South America. The species is usually found within 20 km of shore, but regularly occurs up to 175 km offshore (Zeiner et al. 1990). The California subspecies nests on islands off the coast of southern California, south along the coast of Baja California and the Gulf of California, to Guerrero Mexico (CDFG 1991). Nesting in California occurs in colonies on the Channel Islands and Coronado Islands (Garrett and Dunn 1981). California brown pelicans were observed foraging and resting within the lagoons within the Study Area.

California least tern FE/SE and CFP
Sterna antillarum browni

The California least tern historically nested on coastal beaches from Monterey County to Cabo San Lucas, Baja California. However, substantial population declines have been documented in the last 50 years. The San Dieguito Ecological Reserve has a colony managed by the California Department of Fish and Game. There are also known nesting areas for least terns in San Elijo and Batiquitos Lagoons. The breeding areas are outside of the grading limits; however, some foraging habitat may be impacted during construction. California least terns were observed foraging in San Elijo and Batiquitos Lagoon within the Study Area in 2003 (*Figure 3-20.1a – 3-20.1e*).

Western snowy plover FT/SSC
Charadrius alexandrinus nivosus

The Pacific coast population of the western snowy plover was listed as federally threatened on April 5, 1993. Western snowy plovers forage on both the dry sand of the upper beach and along the wet sand at the beach-surf interface. In Orange and San Diego counties, the snowy plover is a common winter migrant and winter visitor and a fairly common localized breeding resident. The species is declining because of development and degradation of feeding and nesting habitat, increased human disturbance at nest sites, vehicular destruction of nests, and increased predation by introduced predator populations. The snowy plover is known to occur in some of the coastal lagoons; however, there is no nesting area within the project footprint. Some foraging habitat for this species may be impacted by this project at Batiquitos and Agua Hedionda Lagoons.

Coastal California gnatcatcher FT/SSC
Polioptila californica californica

This species is listed as threatened by the USFWS and is a CDFG Species of Special Concern. It is a non-migratory resident whose range covers the coastal plains of southern California and northern Baja California. In San Diego County, it occurs in coastal lowlands generally below 600 m (1968 ft) in elevation and is an obligate resident of coastal sage scrub. However, it is able to utilize other vegetation types such as chaparral and riparian habitats for portions of its territory. The decline of the coastal California gnatcatcher is attributed to the loss and fragmentation of CSS due to urban and agricultural development.

California gnatcatchers were generally found along the fill slopes and a few cut slopes adjacent to the lagoons and in a few adjacent canyons with coastal sage scrub habitat (*Figure 3-20.1 – 3-20.1e*). *Table 3.21.1* lists the number of pairs and individual California gnatcatchers identified by general area within the larger Study Area for I-5.

Table 3.21.1: Coastal California Gnatcatchers Identified within the Study Area

Location	# of California gnatcatchers identified 2003 surveys	# of California gnatcatchers identified 2005 surveys	# California gnatcatchers identified by other projects
Genesee North			6 undetermined status
San Dieguito SW	3 P,1 SM	4P, 1 SM	
San Dieguito NW	1 SM dispersing	--	
San Elijo Lagoon	3 P, 2 SM	5P, 2 SM*	
Manchester East	2 P, 1 SM	1P, 2 SM	
Manchester West	2 SM	NS	
Batiquitos East	1 P	1P	
Batiquitos West	2 P, 1 SM	1P	
Brooks Street	2 P,	NS	
Lawrence Canyon	2 P	NS	

P = Pair, SM = Single male,
NS = Not surveyed in 2005
* in 2007 survey one SM location now has a pair

Least Bell's vireo FE/SE
Vireo bellii pusillus

The least Bell's vireo was once widespread from Tehama County in northern California to northwestern Baja California. This migratory species nests in willows, also using a variety of other shrub and tree species for nest placement. Declines have occurred due to habitat loss and fragmentation, and nest parasitism by the brown-headed cowbird (*Molothrus ater*). Recent population numbers have trended upward. Two vireo territories were detected in the willow woodland east of I-5 near the San Dieguito River; however, they are outside the main Study Area. Protocol surveys for least Bell's vireo along Moonlight Creek in Encinitas were negative in both 2003 and 2004. Least Bell's vireo were detected during California gnatcatcher protocol surveys near Brooke Street and Lawrence Canyon in Oceanside in small patches of riparian habitat (*Figure 3-20.1a – 3-20.1e*). The vireos were over 130 m (426 ft) and 225 m (738 ft) from I-5.

Belding's savannah sparrow SE
Passerculus sandwichensis beldingi

The Belding's savannah sparrow is resident to coastal salt marshes from Santa Barbara County to northern Baja California. In 2006, 32 coastal salt marshes were surveyed and 3,139 breeding territories were identified in 2006. Surveys within the I-5 Study Area, within Belding's savannah sparrow habitat were completed during the spring of 2005 and reported sightings during light-footed clapper rail were also noted. In addition, the CDFG provided the results of their surveys for Belding's savannah sparrows at Buena Vista Lagoon for 2005. Belding savannah sparrows were found in San Dieguito, San Elijo, Batiquitos, and Buena Vista Lagoons (*Figure 3-21.1a – 3-21.1d*). Additional surveys were completed at San Dieguito in 2006 that identified more Belding's savannah sparrows in the northeastern portion of the Study Area (*Figure 3-20.1a – 3-20.1e*).

Southwestern willow flycatcher FE/SE
Empidonax trailli extimus

The southwestern willow flycatcher is listed as State and federally endangered. This subspecies is an uncommon spring and fall migrant and a very rare summer resident. It is found among trees or large shrubs throughout San Diego County. Nesting is restricted to willow thickets in riparian woodland; the local breeding population in San Diego County is now extremely small. Its diet consists of berries, insects and some seeds. It feeds by hovering and gleaning and nests are commonly parasitized by brown-headed cowbirds. Willow flycatchers arrive in southern California later in the spring than do other breeding migratory passerines. They usually arrive about mid-May, but individuals have been documented as early as the first part of May. Surveys for the southwestern willow flycatcher were completed in the riparian habitat in the San Luis Rey River after one was heard vocalizing during a wetland survey (*Figures 3-20.1a – 3-20.1e*). However, subsequent surveys did not detect the southwestern willow flycatcher again. It is likely that the bird detected was migrating through the area at the time. No other suitable habitat is present within the Study Area. The San Elijo Lagoon Conservancy has records of migrant southwestern willow flycatchers at San Elijo Lagoon outside the Study Area.

Tidewater Goby FE/SSC
Eucyclogobius newberryi

The tidewater goby is listed as endangered by the USFWS and is a CDFG Species of Special Concern. This small, nondescript fish is endemic to coastal lagoons and lower stream reaches in brackish to fresh, slow moving to still, but not stagnant water. The substrate usually consists of sand and mud, with abundant emergent and submerged vegetation. It feeds on aquatic insects and small crustaceans. The tidewater goby is thought to be a good indicator of the health of small lagoon ecosystems because of their sensitivity to habitat degradation through fresh water supply diversion, pollution, and siltation that often accompanies urban development. Its low mobility, restricted habitat, and short lifespan make it vulnerable to destruction by human disturbance. Decline of this species is probably due to the effects of lowering and eliminating flows in lower reaches of coastal streams; water pollution, particularly by sewage; and filling and channelization of streams. In San Diego County, the tidewater goby has been recorded from San Mateo Creek; San Onofre Creek; Las Pulgas Creek; Aqua Hedionda, and Buena Vista Lagoons. No tidewater gobies were observed during fisheries surveys at San Elijo, Batiquitos, and Agua Hedionda Lagoons; however, there is a potential for them to occur within the Study Area. The greatest potential for tidewater goby in the Study Area is within Agua Hedionda Lagoon. Due to the tidal weir at Buena Vista Lagoon, the tidewater goby is not anticipated within this lagoon. Culverts at the mouth of the San Luis Rey

River currently limit the potential for tidewater goby to occur within the San Luis Rey River. A project is underway that would allow a more direct connection the River.

Southern Steelhead Trout – Southern ESU FE/SSC
Oncorhynchus mykiss

Steelhead trout were historically found from Alaska to Baja California, Mexico; southern steelhead trout used coastal drainages from south of San Francisco Bay to Baja California. Urbanization and alteration of the streams from the headwaters to the coast are the major factors affecting the steelhead populations. Water diversions, riparian habitat loss, sediment loads within the streams and introduced predators are also threats to the steelhead.

The NOAA fisheries listed the southern steelhead trout (within the southern California steelhead evolutionarily significant unit [ESU]) as endangered. Malibu Creek was the southernmost extent of the listed steelhead population in 1997. NOAA fisheries proposed to extend the range of the endangered steelhead to include the population in San Mateo Creek. Steelhead trout were discovered in San Mateo Creek in 1999. In 2002, the range of the southern California steelhead ESU was extended to Baja, Mexico. In May 2007, a steelhead trout was reported by CDFG personnel in the lower San Luis Rey River.

Critical Habitat

Critical habitat for the least Bell's vireo, southwestern willow flycatcher, tidewater goby, and the California gnatcatcher occurs within the Study Area (*Figures 3-21.1a - 3.21-1d*). Critical habitat for the least Bell's vireo within the Study Area occurs along the San Luis Rey River near the I-5/SR-76 interchange. Critical habitat for the tidewater goby within the Study Area occurs at Agua Hedionda Lagoon. Critical habitat for the California gnatcatcher occurs within coastal sage scrub around San Elijo Lagoon, Batiquitos Lagoon, Lawrence Canyon, and near the Center City Golf Course in Oceanside.

3.21.3 Environmental Consequences

There would be both permanent and temporary impacts to threatened and endangered species as a result of the four build alternatives. Impacts that are common to all four build alternatives are summarized below and impacts specific to each of the four build alternatives are summarized in *Table 3.21.3* and discussed by alternative.

California least terns, western snowy plovers, and brown pelicans were all identified foraging within the lagoons at certain times of the year. No nesting areas for any of these three species would be directly impacted. However, there are least tern nesting areas relatively close to where construction would be completed at San Dieguito and Batiquitos Lagoons. Construction noise and activities may affect birds nesting at these sites. In addition, night lighting due to construction related activities may result in potential adverse effects on breeding behaviors of sensitive species.

Widening of I-5 over the San Luis Rey River would require widening the existing bridge. All four build alternatives have the same impact footprint in this area. It is likely that at least one new column would be placed within the open water of the river. This would impact steelhead trout habitat; however, there would still be a relatively deep open water channel under I-5 after construction is completed. There should be no long term adverse effects to steelhead from construction of this project. Conservation measures are proposed below to minimize any temporary impacts to steelhead trout during construction.

Critical Habitat

Designated critical habitat for the least Bell's vireo, southwestern willow flycatcher, tidewater goby, and the California gnatcatcher all fall within the project footprint of the four build alternatives (*Figures 3-21.1a - 3-21.1d*). Critical habitat for the least Bell's vireo is designated at I-5/SR-76, however, it does not contain the primary constituent elements. Therefore, no impacts are anticipated. Critical habitat for the southwestern willow flycatcher is designated along the San Luis Rey River for its entire length. The four build alternatives are the same in this area and permanently impact 1.1 ha (2.8 ac) of southwestern willow flycatcher critical habitat (*Figures 3-21.1a - 3-21.1d*). This critical habitat impact area is mostly under the bridge over the San Luis Rey River, which would have shading impacts. No impacts to least Bell's vireo or southwestern willow flycatcher critical habitat are anticipated under the no build project.

Tidewater goby critical habitat would be permanently impacted in the open water areas of Aqua Hedionda Lagoon, including approximately 1.70 ha (4.21 ac) for the 8+4 with Buffer, 2.04 ha (5.04 ac) for the 10+4 with Buffer, 2.37 ha (5.86 ac) for the 8+4 with Barrier, and 2.38 ha (5.87 ac) for the 10+4 with Barrier. No impacts to tidewater goby critical habitat are anticipated under the no build alternative.

Critical habitat coverage for the California gnatcatcher includes the freeway, the lagoons, and other habitats that do not exhibit primary constituent elements (*Figures 3.21.1a - 3.21.1d*). To determine permanent impacts to critical habitat for the California gnatcatcher, only those upland habitats with the primary constituent elements were counted, including approximately 9.9 ha (24.5 ac) for the 8+4 with Buffer, 10.9 ha (26.9 ac) for the 10+4 with Buffer, 11.0 ha (27.1 ac) for the 8+4 with Barrier, and 11.3 ha (28.0 ac) for the 10+4 with Barrier alternative. No critical habitat for the California gnatcatcher would be impacted by the no build alternative.

Noise Effects on Wildlife

Increased levels of noise have the potential to affect behavioral and physiological responses in noise sensitive wildlife receptors. Adverse responses to increased noise may include hearing loss or the temporary masking of vocalizations used in communication during the breeding season, nest abandonment, and decreased predator awareness, thereby resulting in a decrease in the reproductive and overall fitness of certain animal species. Increased noise from roadway traffic has the potential to create a situation of long-term hearing loss in wildlife species, while the periodic, point-source noise impacts typically associated with construction activities would result in short-term effects to wildlife species.

A study of the ambient noise and predicted noise levels after completion of the project was completed for each lagoon. Because the noise levels for the four build alternatives are similar, the potential long-term indirect effects of noise are based on the 10+4 with Buffer for future noise levels.

Bird species utilize sound, in the form of a variety of vocalizations (e.g., mating calls, contact notes, etc.), throughout their daily activities and, therefore, are the focus of the potential effects analysis of this study. Bird species associated with the Study Area include the California least tern, western snowy plover, least Bell's vireo, light-footed clapper rail, southwestern willow flycatcher, and Belding's savannah sparrow, all species associated with the wetland/riparian areas within and adjacent to the coastal lagoons along the I-5 corridor. This analysis also addresses potential effects to the coastal California gnatcatcher, an upland bird species, in suitable habitat that occurs between the I-5 corridor and the coastal lagoons.

Temporary increases in noise levels from construction-related activities are considered a direct impact to wildlife. Noise and vibration would vary with distance from construction and elevation below the freeway.

Long term increases in noise levels from the completed project may affect wildlife species and, therefore, could be considered an indirect affect to sensitive wildlife species. The study corridor is already relatively noisy due to the eight lanes of traffic on I-5 and local traffic throughout the corridor. Ambient noise levels in the lagoons vary with distance from the freeway and elevation below the freeway. Fill slopes are not as loud as cut slopes, but traffic noise is still apparent. Ambient noise ranges from as high as 84 A- weighted decibel equivalent sound level (dBA Leq) (1-hour average) on the slopes next to the main lanes at San Elijo Lagoon to the mid 60s in the lagoon. The 60-dBA point is approximately 152 m (500 ft) from the freeway.

There is no single standard or threshold for determining significant noise effects on all bird species. Prior studies that have indicated a possible noise effect threshold for certain species of songbirds have not been scientifically shown to be valid for those species addressed in this report. Therefore, the existing ambient noise levels within the Study Area were compared to the predicted noise levels associated with the proposed future vehicle traffic over the five coastal lagoons along the I-5 corridor.

Future 2035 noise levels were modeled using the maximum LOS C capacity assumptions under the 10+4 lane configuration. No other future conditions were modeled, as this condition would represent the noisiest anticipated scenario. As shown in *Table 3.21.2*, future noise level increases by one to three dBA during the noisiest hour at most receptor points. Two exceptions to this occur at Receptor 10 in Batiquitos Lagoon and Receptor 5 in San Elijo Lagoon. Receptor 10 would increase by 4 dBA due to the loss of a noise barrier resulting from topographic features, such as a berm. Receptor 5 would decrease by one dBA due to the widening of I-5, which would increase the width of the freeway creating a noise barrier immediately adjacent to the roadway due to steep topography.

Potential noise effects associated with the future expansion of the I-5 corridor over the lagoons were determined by calculating the relative noise difference between the predicted future noise and the existing traffic noise contours modeled on field data measurements. The potential effects of traffic noise on noise sensitive wildlife receptors are addressed for each lagoon.

It should be noted that under existing conditions, noise in excess of 70 dBA occurs over various amounts of wetland and upland habitats that either support, or have the potential to support, special status bird species at the five coastal lagoons within the Study Area. Although population numbers have undergone natural fluctuations over the years, these species continue to forage, nest, breed, and otherwise consistently occur within suitable habitat during the breeding season in areas subjected to a wide range of noise levels.

Although a healthy human ear can barely perceive changes on the order of 3 dBA, it is unclear what level is perceptible to bird species in general, and it is even less clear as to what is discernible to the target species of this study. However, the bird species within the lagoons are expected to be exposed to an increase of 2 dBA throughout the entire Study Area, but the relative effects are likely to vary, due to the nonlinear scale in which noise is measured. An increase from 66 to 68 dBA L_{eq} requires a relatively greater amount of acoustic energy, than an increase from 56 to 58 dBA L_{eq}. As such, the birds within the future 66 dBA L_{eq} noise contour may be affected to a greater degree than the rest of the populations of these species in the lagoon.

Table 3.21.2: Modeled Future Traffic Noise Levels

Receptor Number	Existing Noise Levels (dBA L_{eq})	Future Noise Levels (dBA L_{eq})	Difference
San Dieguito Lagoon			
1	64	66	2
2	61	63	2
3	66	68	2
San Elijo Lagoon			
4	64	65	1
5	67	66	-1
6	66	67	1
7	60	61	1
Batiquitos Lagoon			
8	64	66	2
9	62	65	3
10	64	68	4
Agua Hedionda Lagoon			
11	59	62	3
12	62	64	2
13	61	64	3
14	59	61	2
Buena Vista Lagoon			
15	63	64	1
16	63	64	1
17	53	55	2

Indirect Effects

Indirect impacts to threatened and endangered species can result from increased lighting, increased exposure to invasive species, edge effects, and increased potential for pollution from runoff, as well as long term increases in noise. I-5 is already at least eight lanes in width throughout the project and as such already has had an effect of increased lighting at night, increased access from invasive species as well as bisecting habitats that could result in the edge effects. The remainder of the corridor has had increased development that has further encroached on the habitats. All four build alternatives would have incremental increases to indirect effects already on the habitat from the current configuration of I-5. Indirect effects such as increased dust, lighting, invasive species, and noise would be minimized by through the conservation measures listed below. For the No Build Alternative, some of the projects that would go forward may have indirect effects to habitats adjacent to I-5, but would be limited in comparison to the four build alternatives.

Table 3.21.3: Threatened and Endangered Animal Species Impacted by the Four Alternatives

Species	10+4 w/ Barrier	8+4 w/ Barrier	10+4 w/ Buffer	8+4 w/ Buffer
Light-footed clapper rail Permanent	SE=1 indiv.	No perm impacts	No perm. impacts	No perm. impacts
Temporary	BV=1 indiv. SE=1 indiv.	BV=1 indiv. SE=1 indiv.	BV=1 indiv. SE=1 indiv.	BV=1 indiv.
Coastal California gnatcatcher – Permanent	Gen = 2 pairs SD = 4 pairs SE = 5 pairs Bat = 1 pair, 1 indiv.	Gen = 2 pairs SD = 4 pairs SE = 5 pairs Bat = 1 pair, 1 indiv.	Gen = 2 pairs SD = 4 pairs SE = 5 pairs Bat = 1 pair, 1 indiv.	Gen = 2 pairs SD = 4 pairs SE = 5 pairs Bat = 1 pair, 1 indiv.
CAGN-temporary	SD = 1 pair Bat= 1 pair	SD = 1 pair Bat= 1 pair	SD = 1 pair Bat= 1 pair	Bat = 1 pair
Belding's savannah sparrow Permanent	BAT = 1 indiv	BAT = 1 indiv	BAT= 1 indiv	BAT = 1 indiv
Temporary	BAT = 1 indiv	BAT = 1 indiv	BAT = 1 indiv	No temp. impacts

Bat = Batiquitos Lagoon/slopes
SD = San Dieguito Lagoon
SE = San Elijo Lagoon
BV = Buena Vista Lagoon
Perm = permanent
Indiv = individual

10+4 with Barrier

The 10+4 with Barrier alternative would permanently impact three Del Mar manzanita plants. No temporary impacts to this plant would occur under this alternative.

The 10+4 with Barrier alternative would permanently impact portions of the territories of 12 pairs and one single male California gnatcatcher (*Table 3.21.3*). The majority of the California gnatcatchers that would be impacted are on the slopes immediately adjacent to San Dieguito, San Elijo, and Batiquitos Lagoons. This alternative would also temporarily impact a portion of the territories of two pairs of California gnatcatcher, one near San Dieguito and one near Batiquitos Lagoons. This alternative would also permanently impact the territory of one individual Belding's savannah sparrow and temporary impact one individual Belding's savannah sparrow.

The 10+4 with Barrier alternative would permanently impact the territory of one individual light-footed clapper rail at San Elijo Lagoon. In addition, a portion of the territory of one pair and one individual of light-footed clapper rail would also be temporarily impacted by the 10+4 with Barrier alternative (*Figure 3-20.1a – 3-20.1e*).

Least Bell's vireo and southwestern willow flycatcher were identified within the Study Area; however, no nesting areas would be impacted by this project. Some southern willow scrub habitat that may be used by these species as they migrate through to their nesting grounds would be impacted. Approximately 0.07 ha (0.18 ac) of southern willow scrub and 0.99 ha (2.46 ac) of disturbed southern willow scrub would be permanently impacted by the 10+4 with Barrier alternative (*Table 3.17.1*). The majority of this habitat is disturbed and in small patches unlikely to be used by these two species.

10+4 with Buffer

The 10+4 with Buffer alternative would not have any permanent impacts to Del Mar manzanita; however, there is one individual Del Mar manzanita plant within the temporary impact area. This plant is growing along the brow ditch by the onramp from Del Mar Heights Road to southbound I-5. It is possible that this area can be avoided during construction when the design is further along. A temporary impact to the Del Mar manzanita would impact the plant; therefore, efforts would be made to avoid this plant.

The 10+4 with Buffer alternative would permanently impact portions of the territories of 12 pairs and one single male California gnatcatcher (*Table 3.21.2*). This alternative would also temporarily impact a portion of the territories of two pairs of California gnatcatcher, one near San Dieguito and one near Batiquitos Lagoons.

The 10+4 with Buffer alternative would permanently impact the territory of one individual Belding's savannah sparrow at Batiquitos Lagoon. The territory of an individual Belding's savannah sparrow at Batiquitos would be temporarily impacted. There would be no permanent impacts to occupied light-footed clapper rail habitat; however, a portion of the territories of one pair and one individual light-footed clapper rail would be temporarily impacted by the 10+4 with Buffer alternative (*Figures 3-20.1a – 3-20.1e*).

There is no known occupied nesting habitat for the least Bell's vireo or southwestern willow flycatcher within the 10+4 with Buffer impact areas. Some southern willow scrub habitat that may be used by these species as they migrate through to their nesting grounds would be impacted. Approximately 0.06 ha (0.14 ac) of southern willow scrub and 0.93 ha (2.30 ac) of disturbed southern willow scrub would be permanently impacted by the 10+4 with Buffer alternative (*Table 3.17.1*). The majority of this habitat is disturbed and in small patches unlikely to be used by these two species.

8+4 with Barrier

The 8+4 with Barrier alternative would not have any permanent impacts to Del Mar manzanita; however, there is one individual Del Mar manzanita plant within the temporary impact area. This plant is growing along the brow ditch by the onramp from Del Mar Heights Road to southbound I-5. It is possible that this area can be avoided during construction when the design is further along. A temporary impact to the Del Mar manzanita would take the plant; therefore, efforts would be made to avoid this plant.

The 8+4 with Barrier alternative would permanently impact portions of the territories of 12 pairs and one single male California gnatcatcher (*Table 3.21.2*). This alternative would also temporarily impact a portion of the territories of two pairs of California gnatcatcher, one near San Dieguito and one near Batiquitos Lagoons.

This alternative would also permanently impact the territory of one individual Belding's savannah sparrow and temporarily impact the territory of one individual. There would be no permanent impacts to occupied light-footed clapper rail habitat; however, a portion of the territories of one pair and one individual light-footed clapper rail would be temporarily impacted by the 8+4 with Barrier alternative (*Figure 3-20.1a – 3-20.1e*).

Least Bell's vireo and southwestern willow flycatcher were identified within the Study Area; however, no nesting areas would be impacted by this project. Some southern willow scrub habitat that may be used by these species as they migrate through to their nesting grounds would be impacted. A total of 0.07 ha (0.17 ac) of southern willow scrub and 0.95 ha (2.35 ac) of disturbed southern willow scrub would be permanently impacted by the 8+4 with Barrier alternative (*Table 3.17.1*). The majority of this habitat is disturbed and in small patches unlikely to be used by these two species.

8+4 with Buffer

The 8+4 with Buffer alternative would not have any permanent impacts to Del Mar manzanita; however, there are currently three individual Del Mar manzanita plants within the temporary impact area. These plants are immediately adjacent to a brow ditch along the slope. It is possible that this area can be avoided during construction when the design is further along. A temporary impact to the Del Mar manzanita would take the plant; therefore, efforts would be made to avoid these plants.

The 8+4 with Buffer alternative would permanently impact portions of the territories of 12 pairs and one single male California gnatcatcher (*Table 3.21.2*). The majority of the California gnatcatchers that would be impacted are on the slopes immediately adjacent to San Dieguito, San Elijo, and Batiquitos Lagoons. In addition, a portion of the territory of one pair of California gnatcatchers near Batiquitos Lagoon would be temporarily impacted. This alternative would also permanently impact the territory of one individual Belding's savannah sparrow. There would be no permanent impacts to occupied light-footed clapper rail habitat; however, a portion of the territory of one pair of light-footed clapper rail would be temporarily impacted by the 8+4 with Buffer alternative (*Figure 3-20.1a – 3-20.1e*).

Least Bell's vireo and southwestern willow flycatcher were identified within the Study Area; however, no nesting areas would be impacted by this project. Some southern willow scrub habitat that may be used by these species as they migrate through to their nesting grounds would be impacted. Approximately 0.05 ha (0.12 ac) of southern willow scrub and 0.94 ha (2.33 ac) of disturbed southern willow scrub would be permanently impacted by the 8+4 with Buffer alternative (*Table 3.17.1*). The majority of this habitat is disturbed and in small patches unlikely to be used by these two species.

No Build

The majority of the projects that would likely go forward under the no build alternative would not have impacts to threatened and endangered species. However, the I-5/Manchester Avenue interchange, the I-5/SR-78 interchange project and I-5/Genesee Avenue projects may impact some habitat for light-footed clapper rail and/or California gnatcatcher. No impacts to endangered plants are anticipated under the no build scenario.

3.21.4 Avoidance, Minimization, and/or Mitigation Measures

Locations of the endangered Del Mar manzanita have been identified and avoided to the maximum extent practicable. Some of the Del Mar manzanita individuals are growing immediately adjacent to brow ditches that would require reconstruction for proper slope drainage and in those areas the plants could not be avoided. These plants would likely be salvaged and placed in a compensatory mitigation site for the project.

Caltrans is working currently with the groups planning restoration of San Elijo Lagoon and Buena Vista Lagoon to incorporate the needs of that restoration into our bridge design. This could result in longer bridges over these lagoons; however, these studies are not yet completed. Therefore, the current bridge lengths and worse case impacts are examined in this document.

The following are proposed measures to minimize impacts to threatened and endangered species during construction.

- A channel large enough for fish movement would be kept open throughout construction within the San Luis Rey River and all of the lagoons.
- Measures to minimize potential effects of pile driving on fish species would be negotiated with NOAA Fisheries and CDFG.
- All pile driving near the lagoons would be completed outside the bird breeding season (February 15-August 31) to minimize construction noise impacts to bird species around the lagoons.
- A qualified biologist would review grading plans, address protection of sensitive biological resources, and monitor ongoing work for both pre-construction and construction phases. The biologist shall be familiar with the habitats, plants, and wildlife of the Project area, and maintain communications with the resident engineer, to ensure that issues relating to biological resources are appropriately and lawfully managed.
- Detention basins would be placed in many of the loop ramps, and bioswales would be placed on many of the slopes to treat runoff from the freeway.
- Lighting used at night for construction would be shielded away from ESAs.
- Dust generated by proposed operations would be controlled with BMPs.

Due to the length of the project, the sensitive habitats it transverses, and the sensitive species that live along the corridor, there are impacts that could not be avoided and still meet the purpose and need for the project. Compensatory mitigation measures would be used to mitigate for the unavoidable impacts. Possible mitigation ratios and compensatory mitigation have not been agreed upon by the resource agencies at this time. However, the following identifies potential mitigation that has been identified to offset impacts associated with the *I-5 NCC Project*.

Opportunities for compensatory mitigation have been reviewed in all the watersheds along the I-5 corridor. To the extent practicable, some compensatory mitigation would be completed in each watershed; however, there may be more opportunities in some watersheds versus those where extensive restoration projects have already taken place. CSS occupied by California gnatcatcher would be a priority for acquisition, and restoration of coastal lagoon habitats is a focus for wetland mitigation. Caltrans proposes to complete some of the mitigation in advance of impacts to obtain lower compensation ratios.

Regionally important mitigation in the I-5 corridor has been discussed with the resource agencies. Large restoration projects have already been completed at Batiquitos and Agua Hedionda Lagoons and a large project is currently underway in San Dieguito Lagoon. San Elijo and Buena Vista Lagoons are the two lagoons within the project limits where large-scale restoration plans are underway. Caltrans has been working with the Cities and resource agencies to help move these restoration projects forward by assisting in the planning and helping to fund some of the technical studies. Caltrans has discussed a plant with the USFWS that would put together a package to implement the restoration of San Elijo Lagoon, Buena Vista

Lagoon, and also restore USFWS refuge lands at the salt works in San Diego Bay to mitigate for transportation projects along the coastal corridor.

In addition to the regionally important lagoon mitigation Caltrans is funding a study to optimize the I-5 bridges for water exchange on either side of I-5. A team of scientists from Scripps Institution of Oceanography, and WRA have been asked to examine all aspects of lagoon tidal and freshwater hydrology and propose bridge designs that would minimize tidal muting east of I-5 and lead to the possible enhancement of the existing wetlands. . The objective of the study is to evaluate potential effects of bridge widening and formulate bridge design concepts that are hydraulically more efficient and would enhance water quality and reduce tidal muting. By reducing tidal muting with new hydrodynamic optimized I-5 waterway designs, increased tidal inundation can be achieved in the wetlands east of I-5, resulting in an increase in inter-tidal wetland habitat. This study is in its beginning stages; however, the result could enhance wetland habitat and water quality within the lagoons, especially east of I-5. Results of this study would be documented in the Final EIR/EIS. Bridge design features to enhance water flow in the lagoons would be incorporated into bridge final designs.

Proposed mitigation within each of the watersheds is discussed below.

Los Peñasquitos Lagoon
Impacts to the lagoon are minimal and construction of a new bridge at Sorrento Valley Road/Roselle Street, in place of the culvert by the interchange of I-5 and SR-56 should enhance flows through the lagoon and facilitate wildlife crossing under the I-5. There are impacts to this watershed from the expansion of I-5 just north of Genesee Avenue and for the bridge over Los Peñasquitos Creek by the merge with I-805. Caltrans is still looking for mitigation opportunities within this watershed.

San Dieguito Lagoon
Southern California Edison (SCE) started a large restoration project in San Dieguito Lagoon in 2006. They are creating approximately 60.8 ha (150 ac) of tidal wetlands to mitigate for offshore impacts resulting from the warm water outfall at the San Onofre Nuclear Generating System (SONGS). Wetland impacts would be mitigated at a minimum ratio of 1:1 creation for permanent impacts at the San Dieguito Restoration Area.

Caltrans in cooperation with the San Dieguito River Valley Joint Powers Authority is proposing to implement creation of approximately 17 ha (42 ac) of coastal salt marsh adjacent to the SCE restoration project in San Dieguito Lagoon. In addition to the 17 ha (42 ac) of coastal salt marsh created, approximately 7 ha (17.2 ac) of upland habitat would be created along the berms around the wetland and in a native grassland floodplain area adjacent to the wetland. Approximately 1.1 ha (2.73 ac) of the created coastal salt marsh habitat would be used by the JPA for mitigating impacts from their trail system and treatment wetlands. The remainder of the created coastal salt marsh and upland habitat would be used as mitigation for the I-5 North Coast Corridor Project. The proposed plan has already been reviewed and found to be hydraulically compatible with the larger restoration project in San Dieguito Lagoon.

Caltrans, the City of Del Mar, and the San Dieguito River Valley Land Conservancy (SDRVLC) either own or are buying several small parcels of land along Racetrack View Drive and the San Dieguito River. These parcels currently on fill vegetated with ice plant with salt marsh habitat at the rivers edge. Caltrans would then create saltmarsh habitat on the approximately 0.8 ha (two ac) of fill habitat. The property would be turned over to the SDRVLC for management in perpetuity.

In addition, Caltrans is currently in negotiations to purchase approximately 9.3 (23.1 ac) of former tomato fields immediately east of I-5 and south of San Dieguito Lagoon. The area is currently vegetated with weedy species and some coyote brush (*Baccharis pilularis*). Approximately 2.0 ha (5 ac) of this parcel is proposed for a detention basin or water quality treatment area and the remaining 7.3 ha (18.1 ac) would be used to create southern maritime chaparral and CSS.

San Elijo Lagoon
San Elijo Lagoon is one of the last lagoons within northern San Diego County that has not yet had a major restoration project. Currently, the City of Encinitas, ACOE, USFWS, CDFG, County of San Diego, and the San Elijo Lagoon Conservancy are working to complete a Draft EIR/EIS for restoration of the lagoon for environmental compliance. This includes restoration of the hydrological regime and the marsh habitat that is being converted from mudflats and low marsh to middle and high marsh. Caltrans has participated with the City of Encinitas and the ACOE to determine what is the optimal bridge opening at I-5. Therefore, the I-5 bridge over San Elijo Lagoon would likely be lengthened, which would create some wetland habitat.

Caltrans is also considering out of kind mitigation, such as building a new inlet on Coast Highway 101, south of restaurant row in Cardiff by the Sea. This is a large construction project that could ultimately facilitate the restoration of many hectares (acres) of marsh and help to ensure its continued functioning. Although this would not create a large quantity of wetlands, the restoration project would help enhance all lagoon functions and decrease tidal muting effects. Caltrans has already funded hydraulic studies to facilitate the development of the restoration documents. This large regional restoration project would greatly enhance coastal lagoon habitat, in particular mud flats, which are relatively rare within the region. Without the restoration project the lagoon would continue to fill in from sedimentation and wetland habitat would be lost.

In addition, upland slopes around the proposed DAR at Manchester Avenue would be planted with CSS to mitigate for upland impacts.

Cottonwood Creek
There is a small creek that flows intermittently above and below ground through Encinitas between San Elijo and Batiquitos Lagoons. Cottonwood Creek Park was recently created west of I-5, restoring the creek to an aboveground channel between I-5 and the ocean. Moonlight Creek is a small tributary that primarily carries urban runoff from both sides of the freeway parallel to I-5 and immediately west of I-5 where it enters Cottonwood Creek at the park. There is some riparian habitat along this drainage, but the habitat is also disturbed with giant reed, pepper trees, nasturtium (*Tropaeolum majus*), ice plant, and eucalyptus trees. This creek could be restored, as could the slopes which are a mixture of disturbed CSS and ornamental plants. Restoration of this area with a walking trail along the sewer easement has been identified in the as a community enhancement by Caltrans landscape architecture and by the City of Encinitas as a preferred option. Approximately 1.4 ha (3.5 ac) of riparian habitat and 2.0 ha (5.0 ac) of CSS could be restored in this area.

Batiquitos Lagoon
A large restoration project was completed in Batiquitos Lagoon in the 1990s by the Port of Los Angeles to mitigate for impacts at the port. Maintenance dredging and monitoring of created least tern nesting sites were part of the restoration. No large-scale mitigation opportunities have been identified at this lagoon, but several parcels for preservation of upland CSS have been identified, and some small parcels along the edge of the lagoon have been identified for purchase and preservation as permanent open space. The regional mitigation opportunities at San Elijo and Buena Vista would contribute to losses in this system, in addition to the modified bridge design, which could enhance water quality and possibly create more intertidal habitat.

Encina Creek
Encina Creek is a small, constricted creek with no lagoon at the outfall to the ocean. The creek flows through culverts under I-5 and through the Encina Sewer Treatment Plant west of I-5. Immediately east of I-5 the creek is heavily disturbed with invasive plant species, trash, and poor water quality. Upstream of I-5 a few mitigation projects have been completed already. There may be additional opportunities to remove exotic species and restore habitat throughout Encina Creek.

Agua Hedionda Lagoon
A large dredging project was completed in 1998/1999 that created an average depth of 2.4 to 3.4 m (8 to 11 ft), and extensive eelgrass planting was completed in the dredged areas. This lagoon is primarily a deepwater lagoon with little fringing wetland habitat. Agua Hedionda was the location of a large project to eradicate *Caulerpa* toxic algae that was first discovered in 2002. It was thought to be eradicated by 2006, but monitoring continues.

Caltrans has identified two areas for purchase that were proposed for development on the eastern side of the lagoon. These properties are a combination of disturbed coastal sage scrub, salt marsh, and disturbed habitat along the northern shore of the eastern basin. Approximately 8.5 ha (21.1 ac) of habitat has been identified for acquisition. Mitigation on this site would be a combination of creation of some salt marsh and coastal sage scrub habitat and preservation of the remaining habitat. Some of the coastal sage scrub habitat is currently occupied by the threatened coastal California gnatcatcher.

Buena Vista Lagoon
The Buena Vista Lagoon Foundation and Technical Advisory Committee (BVTAC) have proposed options including keep the lagoon all freshwater, to have a mix of salt and freshwater habitat, or open up tidal flushing to convert Buena Vista Lagoon to all saltwater. Currently, the BVTAC is pursuing the proposal to convert Buena Vista Lagoon to all saltwater habitat. The BVTAC will complete a Draft EIR/EIS for restoration of the lagoon for environmental compliance. This would require modifying the inlet from the ocean, a modified bridge at I-5 and other restoration. To accomplish any restoration requires the potential purchase of a number of privately held parcels within and on the perimeter of the lagoon. Caltrans is currently working with the CDFG and the BVTAC to identify these parcels and is looking into purchasing them. This mitigation would help the overall health of the lagoons and coastal systems without large hectares (acres) of creation.

Caltrans has been meeting with the owners of a 1.6 ha (3.9-ac) parcel in the western basin, west of Coast Highway 101 where a resort has been proposed. The existing parcel is primarily disturbed habitat and some wetland that can be restored. Purchase of this parcel would be key to limiting additional development adjacent to the lagoon.

Loma Alta Creek
Loma Alta Creek is a very disturbed constricted creek that flows parallel to Oceanside Boulevard in a developed portion of Oceanside. West of I-5 the creek is channelized where it flows through a trailer park to an industrial area prior to reaching the ocean through a highly constricted culvert. The portion through the trailer park is within concrete channel with little area for restoration. However, west of the trailer park the creek is in an earthen channel surrounded by industrial businesses. There may be an opportunity in this portion of the creek to greatly enhance the wetland habitat and water quality before the water empties into the Pacific Ocean.

San Luis Rey River
The San Luis Rey River near I-5 is a large open water channel with primarily freshwater marsh and arundo scrub along the banks. Two projects proposed for the area, Coast Highway Seismic Retrofit and the recently completed Pacific Street Bridge have already proposed restoration of the wetlands along the banks of the river through exotic removal and revegetation with natives. Mitigation for impacts at the San Luis Rey River would be completed by debiting credits from the Pilgrim Creek Mitigation Bank.

Compensatory mitigation for upland habitats would likely encompass a mixture of creation of new CSS habitat and purchase of parcels of high quality habitat near the lagoons for preservation. Several parcels have been identified around the lagoons for potential purchase for upland mitigation. All of the mitigation ratios, and potential options would continue to be discussed with the resource agencies to determine the most appropriate selection of options to mitigate impacts from this project.

Figure 3-21.1a Critical Habitat

Figure 3-21.1b Critical Habitat

Figure 3-21.1c Critical Habitat

Figure 3-21.1d Critical Habitat

3.22 Invasive Species

3.22.1 Regulatory Setting

On February 3, 1999, President Clinton signed Executive Order 13112 requiring federal agencies to combat the introduction or spread of invasive species in the United States. The order defines invasive species as "any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health." FHWA guidance issued August 10, 1999 directs the use of the State's noxious weed list to define the invasive plants that must be considered as part of the NEPA analysis for a proposed project.

3.22.2 Affected Environment

The slopes of I-5 have varying amounts of invasive species growing on them including pampas grass, ice plant, African fountain grass, and annual species. Recently African veldt grass and onion weed (*Asphodelus fistulosus*) have become increasing problems as they spread along the right-of-way. African veldt grass has become a dominant species on the cut slope of I-5 between Del Mar Heights Road and Birmingham Drive. They are spreading into the habitats around the lagoons as well.

Tamarisk, arundo, castor bean, and fennel are common invasive species within the wetland habitats within the corridor. There are groups working to control these species particularly in the lagoons; however, they are persistent invasive species.

3.22.3 Environmental Consequences

The area already has a number of aggressive invasive species both on the slopes of I-5 and in the wetland habitats. Construction of any of the build alternatives presents the opportunity for these exotic species to spread. The disturbance of ground during construction provides new ground for weeds to germinate. If minimization measures listed below and partnerships are formed, the growth of invasive species may be reduced. The no build alternative would not disturb any new ground; however, existing invasive species problems would likely become worse through time and species spread.

3.22.4 Avoidance, Minimization and/or Mitigation Measures

The construction of any of the build alternatives provides an opportunity to control some of the invasive species on the slopes of the project. Through careful handling of the soil and equipment that works the soil, the invasive plants currently within the impact area can be removed. Revegetation of the slopes would require maintenance to keep the weed species from reinvading the new slopes. Partnerships would be required with the lagoon foundations and landowners to simultaneously work to eradicate similar invasive species outside of the impact areas.

There are several invasive weed species already growing within the right-of-way along I-5. Special care would be taken when transporting, use and disposing of soils with invasive weed seeds. All heavy equipment would be washed and cleaned of debris prior to entering a lagoon area, to minimize spread of invasive weeds.

The following conservation measure was stated in *Section 3.17 and t*he remainder of the conservation measures for species and compensatory mitigation for the project is discussed in *3.19, 3.20,* and *3.21*.

- Cut slopes would be revegetated with native upland habitats with similar composition to those within the project limits. Fill slopes and areas adjacent to wetlands and drainages would be revegetated with appropriate native upland and wetland species. The revegetated areas would have temporary irrigation and be planted with native container plants and seeds selected by the biologist. There would be at least three years of plant establishment/ maintenance on these slopes to control invasive weeds and ensure that the plants become established. Bioswales and detention basins would be planted with appropriate native species as determined by the biologist and storm water personnel. Slopes adjacent to developed urban areas would be vegetated with native and drought tolerant non-invasive species selected by the biologist and landscape architect. Interchanges located in urban areas would be landscaped with native or ornamental non-invasive species.

3.23 Relationship Between Local Short-Term Uses of the Human Environment and the Maintenance and Enhancement of Long-Term Productivity

Implementation of the no build alternative would not offer the benefits or losses of the build alternatives. It would not resolve worsening congestion on local streets and highways.

Implementation of build alternatives would result in attainment of short-term and long-term transportation and economic objectives at the expense of some long-term social, aesthetic, biological, noise, and other land use impacts. These transportation improvements are based on State and local comprehensive planning, which considers the need for present and future traffic requirements with the context of present and future land use development. The local short-term impacts and use of resources by the proposed project is consistent with maintenance and enhancement of long-term productivity for the local area and the county.

Short-term uses of the project include benefits with increased jobs and revenue generated during construction. Short-term losses associated with the proposed project could include economic losses experienced by businesses affected by relocation; construction impacts such as noise, and motorized and non-motorized traffic delays or detours.

Long-term productivity includes benefits, such as, improvement of the transportation network of the region and project vicinity, increase access facilitating economic growth, to maintain or improve future congestion and delay, and preserve and restore some of the biological resources. Additional benefits Include, community enhancement opportunities for pedestrian, visual, and community cohesive features. Long-term losses associated with the proposed project include an insignificant loss of plant and wildlife resources, a permanent visual impact to the surrounding communities, energy use, fuel use, and use of construction materials including concrete, steel and asphalt.

3.24 Irreversible and Irretrievable Commitments of Resources that Would be Involved in the Proposed Project

Some irreversible effects would curtail the range of potential future uses of the environment with either the No Build alternative, or any of the four Build alternatives.

Implementation of any of the proposed build alternatives involves a commitment of a range of natural, physical, human, and fiscal resources. Land used in the construction of the proposed facility is considered an irreversible commitment and would preclude conversion to any other future use of this land except for the proposed transportation facility. However, if a greater need arises for the land use or if the highway facility is no longer needed, the land could be converted to another use. At present, there is no reason to believe such a conversion would ever be necessary or desirable.

Considerable amounts of fossil fuels, labor, and highway construction materials such as cement, aggregate, and bituminous material are expended during construction. Additionally, large amounts of labor and natural resources are used in the making of construction materials. These materials are generally not retrievable. However, they are not in short supply and their use would not have an adverse effect upon continued availability of these resources. Any construction would also require a substantial one-time expenditure of both state and federal funds, which are not retrievable; savings in energy, time, and a reduction in accidents would offset this. In addition to the costs of construction and right-of-way, there would be costs for roadway maintenance, including pavement, roadside, litter/sweeping, signs and markers, electrical and storm maintenance.

The commitment of these resources is based on the concept that residents in the immediate area, region, and state would benefit from the improved quality of the transportation system. These benefits would consist of improved accessibility and safety, which are expected to outweigh the commitment of these resources.

3.25 Cumulative Impacts

3.25.1 Regulatory Setting

Cumulative impacts are those that result from past, present, and reasonably foreseeable future actions, combined with the potential impacts of this project. A cumulative effect assessment looks at the collective impacts posed by individual land use plans and projects. Cumulative impacts can result from individually minor, but collectively substantial impacts taking place over a period of time.

Cumulative impacts to resources in the project area may result from residential, commercial, industrial, and highway development, as well as from agricultural development and the conversion to more intensive types of agricultural cultivation. These land use activities can degrade habitat and species diversity through consequences such as displacement and fragmentation of habitats and populations, alteration of hydrology, contamination, erosion, sedimentation, disruption of migration corridors, changes in water quality, and introduction or promotion of predators. They can also contribute to potential community impacts identified for the project, such as changes in community character, traffic patterns, housing availability, and employment.

CEQA Guidelines, Section 15130, describes when a cumulative impact analysis is warranted and what elements are necessary for an adequate discussion of cumulative impacts. The definition of cumulative impacts, under CEQA, can be found in Section 15355 of the CEQA Guidelines. A definition of cumulative impacts, under NEPA, can be found in 40 CFR, Section 1508.7 of the CEQ Regulations.

3.25.2 Cumulative Analysis

Table 3.25.1 of this document summarizes adverse impacts that could occur from implementation of the proposed project, including impacts to community cohesion, environmental justice, visual/aesthetics, natural communities, and wetlands and other waters of the U.S. and state, as addressed in this cumulative analysis. Two issue areas are not further evaluated within this cumulative impacts analysis; these are community cohesion and environmental justice. Environmental Justice and community cohesion are issues that are specific to an affected population or community and are not incrementally cumulative across the corridor. No additional projects were identified with potential environmental justice impacts or community cohesion impacts within the community affected by the proposed project, therefore the project could not contribute to cumulative effects. Table 3.25.1 summarizes those projects within the cumulative study area (comprised of specific Resource Study Areas (RSAs) that would result in adverse impacts to those resources that would also be adversely affected by the *I-5 NCC Project*.

3.25.3 Environmental Consequences

Visual/Aesthetics Resources

The landscape of northern coastal San Diego County is characterized by the Pacific Ocean and natural features formed by the action of water on earth. Sandy beaches, sandstone bluffs, coastal lagoons, broad river valleys, steep canyons, expansive mesas, and rolling foothills constitute the predominant landforms. Much of the coastal plain is already developed with varying densities of urban and suburban development. Along the I-5 corridor there are various scenic areas including lagoons and harbors, coastal parks, and prominent land and water features. Subsequently, the region is a major tourist destination.

The I-5 freeway passes through San Diego's north county seaside communities, whose visual components establish the character of the corridor. Although each community has a unique visual identity, a powerful unity is also present because of shared landform components. The San Diego coast continues to boast a beautiful landscape despite intense urban development of the past 30 years, which has changed the character of the corridor greatly. Nevertheless, the scenic area continues to draw new visitors and residents each year.

The Visual Impact Assessment identifies 18 different Landscape Units and 17 "Key Views" in order to assess the visual impacts of the project. These Landscape Units encompass the area along the proposed project corridor that could be visually affected by the project. For the purposes of this analysis, the visual resources RSA is therefore defined as these identified landscape units and everything west to the Pacific Ocean, as shown in *Figure 3-25.2*.

Of the 17 "Key Views" identified in the Visual Impact Assessment, nine have been assessed to have High visual impact, five have been assessed to have Moderately High visual impact, two have Moderate visual impact, and one has been determined to have No Impact, as identified in Section 3.11. There are visual resource impacts to eight of the 18 Landscape Units including loss of ocean view, loss of view of resource, and impact to resource. There are also corridor impacts to 16 Landscape Units, including loss of desirable view or "Tunnel" effects, large walls or structures and loss of mature trees. There are 15 Landscape Units that have been identified to have community visual impacts because of their proximity to the freeway and incompatible community entry.

There are several planned projects in or near the project limits that could have visual impacts. The I-5/Genesee Avenue Bridge Widening and Interchange Improvement, I-5/SR-56 Interchange, I-5/SR-78 Interchange, and the recently completed I-5 Lomas Santa Fe Road Interchange projects would all potentially contribute to visual impacts along the I-5 corridor. The LOSSAN project would also contribute to the degradation of visual quality along the corridor because of new structures around the lagoons. In addition, the Carlsbad Energy Center would also contribute to the degradation of visual quality along the corridor with removal of screening vegetation. Hall Community Park is located directly adjacent to the freeway corridor, and would potentially contribute to the visual impacts along the corridor due to lighting impacts. Other projects that are located within the RSA, but would not contribute to overall visual impacts include the Riverview Office Project in Del Mar, the Mixed-Use Solana Beach Train Station, Beacon's Beach Access Project in Encinitas, the construction of the Northern Inlet Jetty in Carlsbad, and the Oceanside Pier Resort. These projects, although located within the RSA, are not located within the corridor viewshed or would not contribute to urbanization along the corridor, and would not contribute to cumulative visual effects associated with the proposed project. The projects that are located within the I-5 viewshed would incrementally contribute to a cumulative change in visual character within the RSA from semi-urban to urban. The change to the visual resource of the area brought about by these planned projects would be considered a cumulatively considerable contribution.

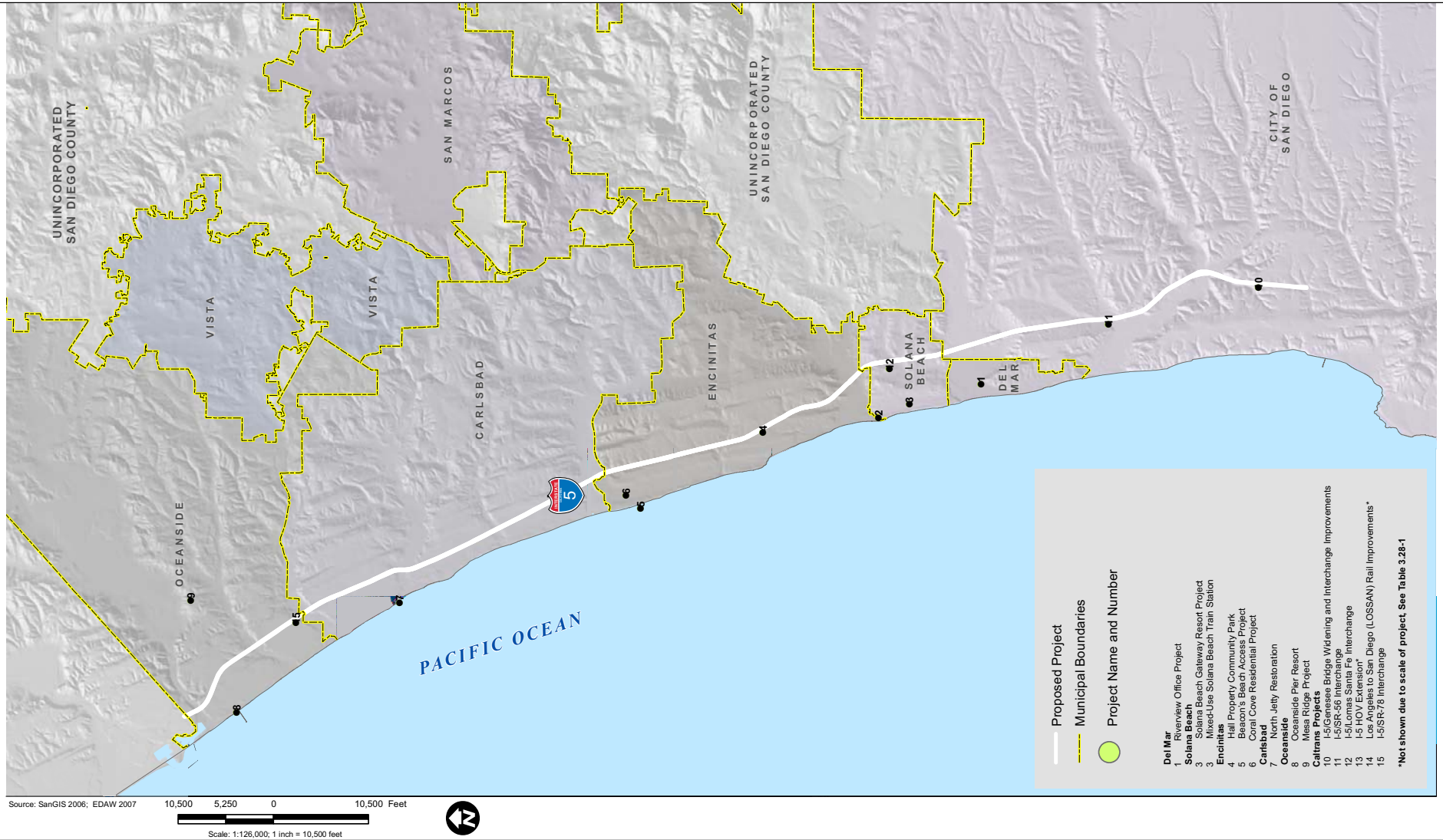


Figure 3-25.1 Approximate Locations of Cumulative Projects

Table 3.25.1: Cumulative Projects

Map Number/ Project Name Del Mar	Location	Proposed Development	Identified Cumulative Impacts	Project Status
1. Riverview Office Project	Jimmy Durante Boulevard and San Dieguito Drive	Construction of two multi-level commercial office buildings	Visual Resources – Potential impact due to visual/aesthetics changes associated with commercial development on vacant land.	Project is in review final phase.
Solana Beach				
2. Solana Beach Gateway Resort Project	Highway 101 and E Circle Drive	30-unit hotel development with associated clubhouse, outdoor pool, and spa	Wetlands and Other Waters – Substantial loss of wetlands from San Elijo Lagoon.	Approved.
3. Mixed-Use Solana Beach Train Station	Lomas Santa Fe Drive and North Cedros Avenue	Parking facility and mixed-use, transit-oriented development	Visual Resources –Substantial visual impact cumulative impacts to visual/aesthetics associated with introduced building heights which are incongruent with surrounding land uses.	Approved.
Encinitas				
4. Hall Property Community Park	Santa Fe Drive and I-5	17.9 ha (44 ac) of public community park	Visual Resources –Substantial visual impact cumulative impacts to visual/aesthetics associated with light pollution.	Project in environmental review phase.
5. Beacon's Beach Access Project	Neptune Avenue and Leucadia Boulevard	Improvements to beach access	Visual Resources – Substantial visual impact cumulative impacts to visual/aesthetics associated with sand redistribution.	Under public review.
6. Coral Cove Residential Project	Ashbury Street and Vulcan Avenue	69 units on a 4-ha (10-ac) project site	Wetlands and Other Waters – Substantial water quality impacts during construction.	Under construction.
Carlsbad				
7. Northern Inlet Jetty Restoration	Agua Hedionda Lagoon	Reconstruction/ seaward extension of existing northern tidal inlet jetty	Visual Resources – Potential impact due to decreased beach width south of northern inlet. Natural Communities – Loss of surfgrass habitat offshore of North Beach. Wetlands and Other Waters – Potential for decreased beach width at Middle Beach and South Beach from deflection.	Project in review phase.
Oceanside				
8. Oceanside Pier Resort	Pacific Street and Pier View Way	136 timeshare units, 32 hotel units, 444 m^2 (4,780 square ft) of restaurant space, and 718 m^2 (7,730 square ft) of retail space	Visual Resources – Substantial visual impact due to mid-rise towers. Incongruent with current visual character.	Approved and under construction.
9. Mesa Ridge Project	Mesa Drive and Foussatt	Development of 70 townhomes on a 9.6-ha (23.8-ac) site	Natural Communities – Project results in permanent loss of 4.9 ha (12.20 ac) of non-native grassland. Mitigation to occur at a 0.5:1 ratio.	Beginning final environmental phase review.

Caltrans Projects				
10. I-5/Genesee Bridge Widening and Interchange Improvements	City of San Diego at I-5/Genesee Avenue Interchange	Reconstruction of existing Genesee interchange; add southeast and northwest loops; signalize interchange	Visual Resources – Potential Impacts. Natural Communities – Potential Impacts Wetlands and Other Waters – Potential Impacts.	Beginning environmental review phase.
11. I-5/SR-56 Direct Connectors	City of San Diego at interchange of I-5 and SR-56	Construct freeway-to-freeway connectors via direct ramps or local street connections	Visual Resources – Potential impacts.	Beginning environmental review phase; estimated completion 2013
12. I-5/Lomas Santa Fe Interchange	City of Solana Beach at interchange of I-5 and Lomas Santa Fe	Construct Auxiliary lanes and modify existing interchange	Visual Resources – Overall moderate adverse effect of visual quality of moderate extended duration due to the introduction of new structures and improvement of existing structures.	Project finalized.
*13. Los Angeles to San Diego (LOSSAN) Rail Improvements	From the Los Angeles to San Diego	Program-level evaluation of double-tracking of railroad tracks	Community Cohesion – Possible impacts include displacement of commercial and residential properties; community and neighborhood disruption. Visual Resources – Potentially significant cumulative impacts to visual/aesthetics. Natural Communities – Potential impacts to several sensitive biological species and habitats. Wetlands and Other Waters – Potential impacts to several water resources and wetlands.	Project finalized.
14. I-5/SR-78 Interchange	I-5 at SR-78	Direct connectors, potentially by construction of a Managed Lane/HOV Connector, between I-5 and SR-78	Wetlands and Other Waters – Potential impacts to wetlands. Visual Resources – Potential impacts due to Managed Lane/HOV Connector ramps.	Preliminary design phase.

* Not shown in Figure 3-25.1 due to length of project.

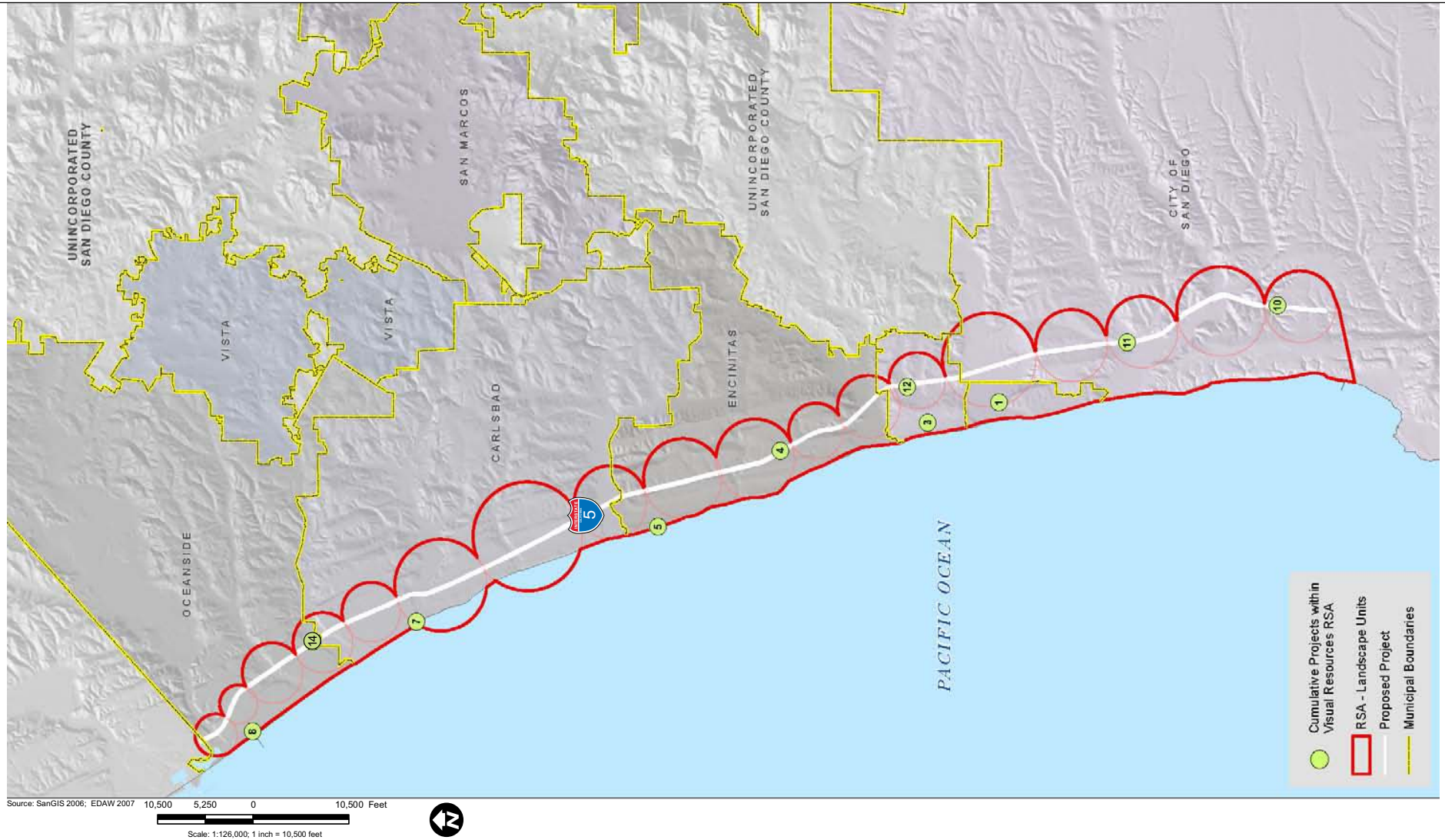


Figure 3-25.2 Cumulative Projects within Visual Resources RSA

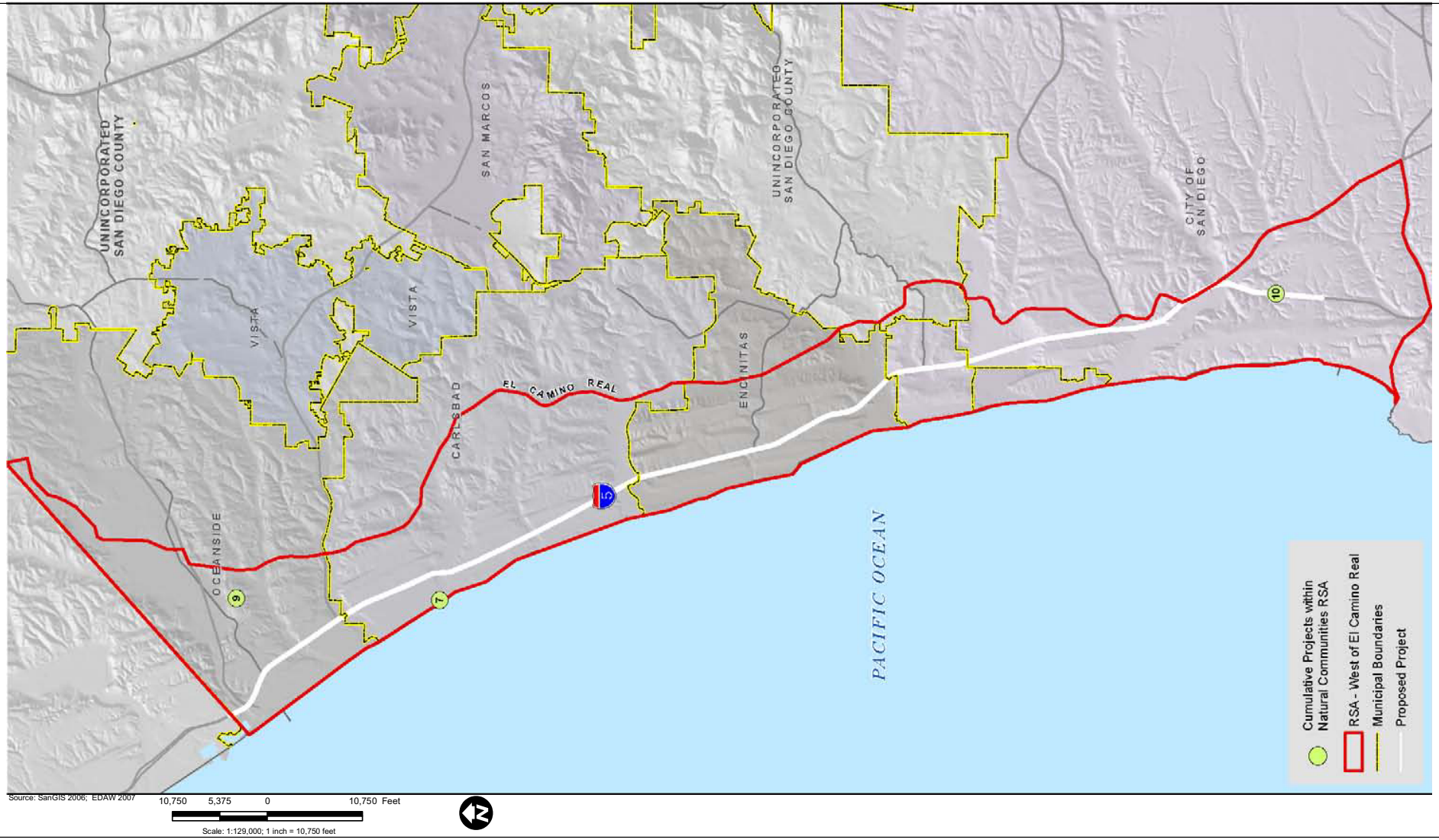


Figure 3-25.3 Cumulative Projects within Natural Communities RSA

Figure 3-25.4 Cumulative Projects within Wetlands and Other Waters RSA

Natural Communities

Development west of I-5 is essentially built to capacity, with redevelopment projects as the standard practice. East of I-5, development continues rapidly with development adjacent to I-5 nearing capacity and increasing further inland. The areas around the lagoons, Los Peñasquitos Canyon in the south, and Camp Pendleton to the north are the main remaining areas of open space in the project corridor. The natural community RSA is therefore considered coastal San Diego County between El Camino Real and the Pacific Ocean, as shown in *Figure 3-25.3.*

Development over time throughout the coastal region has reduced the amount of native habitat and species in the region. This development has also limited the ability to expand habitat around the lagoons and large open space areas. However, there is currently a large effort to restore salt marsh habitat around San Dieguito Lagoon, and there are plans to restore San Elijo, Agua Hedionda, and Buena Vista lagoons.

The regional decline in native habitats and the plant and wildlife species they support has resulted in countywide conservation efforts. The San Diego MSCP was developed as a regional plan to provide for the long-term preservation of sensitive plant and animal species and natural vegetation within the City of San Diego, while allowing for continued economic development within the region. Subsequently, the MHCP and the North County MSCP have been developed for portions of San Diego County that were not originally addressed in the San Diego MSCP.

Past development along the I-5 corridor has impacted each of the watersheds and lagoons in San Diego County. Construction of the railroad and Pacific Coast Highway resulted in causeways across the coastal lagoons, limiting tidal influences and forcing flows through one area, in the late 1800s and early 1900s. The original construction of I-5 in the 1960s further impacted the wetlands of the lagoons and constrained lagoon hydraulics with placement of fill and bridges over the lagoons east of the railroad bridges. Some of the planned restoration projects for San Elijo and Buena Vista lagoons plan to reduce tidal muting and enhance flows and wetland habitats in the lagoons.

I-5 improvements would permanently impact up to 13.10 ha (32.35 ac) of wetland habitats and several sensitive species associated with that habitat. This project would also impact up to 33.7 ha (83.2 ac) of sensitive upland habitats and associated species, as described in *Section 3.17*.

There are two large foreseeable future projects within the corridor that include the LOSSAN double tracking of the railroad, and building the missing connector ramps at I-5 and SR-78 near Buena Vista Lagoon. Both of these projects have the potential to incrementally impact additional wetland habitats and sensitive species. The I-5/SR-78 interchange project intends to build structures over the wetland habitat at Buena Vista Lagoon; however, wetlands would still be impacted by bridge columns. Mitigation for the I-5/SR-78 Interchange project would occur in advance of the project with the I-5 NCC Project mitigation. There has been discussions concerning using the LOSSAN project to build longer railroad bridges and remove some of the fill within these coastal lagoons. There is a programmatic environmental document for the LOSSAN project and it is anticipated that the project would impact wetlands and other sensitive natural communities along the corridor. Two smaller foreseeable future projects, the Northern Inlet Jetty Restoration in Carlsbad and the Mesa Ridge Project in Oceanside, would also contribute to loss of habitat in the RSA.

The I-5 *NCC Project* would have an incremental contribution of up to 13.1 ha (32.35 ac) of wetland loss and 33.7 ha (83.2 ac) of sensitive upland loss. The project would also impact territories of the California gnatcatcher, light-footed clapper rail, and Belding's savannah sparrow within the already constrained habitats in the corridor. The incremental impacts to each individual watershed are small; however, over the entire project the impacts would result in a cumulatively considerable contribution to the corridor's natural communities and sensitive species.

Wetlands and Other Waters

The proposed project traverses several wetlands and waters that are fed by a number of streams and rivers. Los Peñasquitos, San Dieguito, San Elijo, Batiquitos, Agua Hedionda, and Buena Vista lagoons and the San Luis Rey River are the major wetland and open water bodies along the project corridor. Therefore, for the purposes of this cumulative discussion, the RSA is defined as the hydrologic subareas associated with these coastal lagoons, as shown in *Figure 3-25.4*.

The Los Peñasquitos Creek watershed, composed partly of the hydrologic subarea surrounding Los Peñasquitos Lagoon, encompasses a land area of approximately 259 km^2 (100 mi^2) including portions of the cities San Diego, Poway, and Del Mar. The watershed is highly urbanized, with a population of approximately 400,000 residents. The creek discharges to a 155 ha (384 ac) lagoon that is identified as an impaired water body on the California 303(d) list for sedimentation. Historically, the lagoon supported Native American settlements. More recently, the surrounding areas were used for grazing, and from 1962 to 1972, treated sewage was discharged into the lagoon.

The Rancho Santa Fe hydrologic subarea surrounding San Dieguito Lagoon is part of the San Dieguito River watershed, which extends through a diverse array of habitats from its eastern headwaters in the Volcan Mountains to the outlet at San Dieguito Lagoon and the Pacific Ocean. There are several important natural areas within the watershed that sustain a number of threatened and endangered species. Among these are the 89-km (55-mi) long, 32,375 ha (80,000 ac) San Dieguito River Park; the 61 ha (150 ac) San Dieguito Lagoon; and five water storage reservoirs including Lake Hodges, Lake Sutherland, and Lake Poway. In San Dieguito Lagoon, sewage was discharged into oxidation ponds and into channels from 1940 to 1974. An area between the channel arms supported an airfield and light industry between 1942 and 1964 (a Coastal Commission study dates airfield construction to the 1920s). Farming has occurred intermittently at the site of the lagoon both east and west of I-5 since the 1920s, and the racetrack and fairground were built on fill in 1935. Southern California Edison (SCE) started a large restoration project in San Dieguito Lagoon in 2006. They are creating approximately 60.8 ha (150 ac) of tidal wetlands to mitigate for offshore impacts resulting from the warm water outfall at the San Onofre Nuclear Generating System (SONGS).

The Carlsbad hydrologic unit encompasses 544 km^2 (210 mi^2) within northern San Diego County that extends well beyond the boundaries of the City of Carlsbad. It covers substantial portions of the cities of Oceanside, Vista, San Marcos, Escondido, Encinitas, and Solana Beach in addition to most unincorporated portions of the County of San Diego. The hydrologic unit is separated into several hydrologic subareas, including San Elijo, Batiquitos, Los Monos, and El Salto. The Agua Hedionda, Buena Vista, and San Elijo lagoons in the Carlsbad watershed are experiencing impairments to beneficial uses due to excessive coliform bacteria and sediment loading from upstream sources. These coastal lagoons represent critical regional resources that provide freshwater and estuarine habitats for numerous plant and animal species. Other water bodies in the Carlsbad hydrologic subarea have been identified as impaired on the California 303(d) list for elevated coliform bacteria, including several locations in the Pacific Ocean near creek and lagoon outlets.

The San Elijo hydrologic subarea extends to the east of the San Elijo Lagoon. Coast Highway 101, the SDNR, and I-5 divide the lagoon into three basins connected by narrow channels. San Diego County, with the assistance of the CDFG, manages all three basins as an Ecological Reserve. The Reserve has 16.1

km (10 mi) of trails and accommodates approximately 50,000 visitor-days per year; most use is passive recreational activities such as fishing and horseback riding, which are permitted in selected areas. Several dikes and levees were constructed between 1880 and 1940 to create access roads, duck ponds, and sewage treatment ponds in San Elijo Lagoon. The dikes have eroded and hunting was discontinued in 1971. From 1940 until as late as 1973, the lagoon received wastewater from the City of Escondido.

Batiquitos Lagoon, within the Batiquitos hydrologic subarea, is also divided into three basins by El Camino Real, Carlsbad Boulevard, Highway 101, I-5, and the SDNR. In 1983, the lagoon was designated a CDFG State Ecological Reserve. Passive recreation is the predominant use, and there are two trails along the north shore of the lagoon. In the eastern basin, 10 ha (25 ac) were used as evaporation ponds from 1901 to 1910, and secondary treated wastewater was discharged into the lagoon from 1967 to 1974.

In the Agua Hedionda Lagoon, in the Los Monos hydrologic subarea, SDG&E constructed the Encina power plant and a tidal basin to provide its cooling water in the 1950s. A mitigation project involving restoration of several wetland habitats was undertaken in 1985 and considered unsuccessful. SDG&E expects to implement a dredging project in the future, which may include revegetation of some areas with eelgrass.

The El Salto hydrologic subarea encompasses Buena Vista Creek and Buena Vista Lagoon. The lagoon is within a State Ecological Reserve in which fishing and passive recreation are permitted uses, and a visitor center run by the local chapter of the National Audubon Society offers interpretive information. Similar to Batiquitos and San Elijo lagoons, Buena Vista Lagoon is crossed by I-5, Coast Highway 101, and the SDNR, dividing it into four basins. The railroad was built in 1883, and salt evaporation ponds were constructed in 1900. Treated effluent was discharged into the lagoon from 1956 to 1965; since 1960, 65 ha (160 ac) of marsh have been filled for development purposes. Surrounding lands were dedicated to grazing and farming prior to the rapid urbanization that began in the 1970s.

As discussed in *Section 3.18*, wetland habitat impacts associated with each of the alternatives include impacts at the six lagoons, as well as the San Luis Rey River, Loma Alta Creek, Encina Creek, Cottonwood Creek, and numerous small lined and unlined drainage ditches that run parallel to I-5. All drainage ditches, arundo scrub, and salt marsh transition habitats are included in the wetland habitats of the state. The majority of project impacts to wetland habitats are associated with widening of the freeway corridor at the lagoons. Impacts to southern coastal salt marsh, coastal brackish marsh, coastal brackish marsh (disturbed), mud flat, and open water are primarily related to impacts at the lagoons. Overall, the proposed project would permanently impact up to 13.10 ha (32.35 ac) of wetland habitats.

There are several projects located near the lagoons that may contribute to cumulative impacts to wetlands. The Solana Beach Gateway Resort is a 30-unit hotel development with various associated amenities that would potentially have cumulative impacts to San Elijo lagoon. Also near San Elijo lagoon, the Coral Cove Residential Project, a 69-unit development, would have substancial water quality impacts during construction. At Agua Hedionda Lagoon, there is potential for cumulative impacts with the North Inlet Jetty Restoration Project. I-5/Genesee Bridge Widening and Interchange Improvements would also contribute to wetland impacts upstream of Los Peñasquitos Lagoon. The LOSSAN project could impact up to 8-11 ha (20-27 ac) of wetlands, and up to 4.9 ha (12 ac) of lagoons, a number of which are within the Wetlands and Other Waters RSA, contributing to a cumulatively considerable impact.

There are also a number of restoration plans and projects being planned or implemented within the lagoons along the project corridor. Restoration is currently ongoing at San Dieguito Lagoon, while work is proposed at Buena Vista Lagoon. In addition, restoration programs are planned for development for San Elijo Lagoon, as well as preparation of a comprehensive lagoon study of all lagoons and identification of specific restoration opportunities within each.

While this restoration work would reduce some of the impacts to lagoons and wetlands along the project corridor, the proposed *I-5 NCC Project* would continue to result in a cumulatively considerable contribution to wetland impacts along the corridor.

3.25.4 Avoidance, Minimization and/or Mitigation Measures

Visual/Aesthetics Resources

Mitigation measures for adverse and cumulatively considerable impacts are located in *Section 3.11*. Implementation of the measures in this section would partially mitigate adverse effects of the project. Visual impacts would not be fully mitigated.

Natural Communities

Mitigation measures for adverse and cumulatively considerable impacts are located in *Section 3.20*. Impacts to natural communities would not be fully mitigated using standard mitigation ratios. Caltrans is currently in negotiations with resource agencies that have jurisdiction to determine an appropriate mitigation strategy. Mitigation for impacts to native upland communities would reduce the cumulative impacts to less than considerable.

Wetlands and Other Waters

Mitigation measures for adverse and cumulatively considerable impacts to wetlands and other Water of the US that are located in *Section 3.21*.

As discussed above, there are a number of restoration plans and projects currently under development for the various lagoons located along the corridor. These plans focus on restoring the ecological functions and values of each of the coastal lagoon ecosystems, taking into account historic habitat regimes, hydraulic functioning, tidal flows, and species distribution, among other factors. Rather than focusing on a ratio-based mitigation program, Caltrans proposes to mitigate potential project impacts along the I-5 North Coast corridor by implementing components of lagoon restoration, as determined appropriate by lagoon stakeholders. This more comprehensive mitigation approach would provide a more holistic restoration of coastal wetlands and other waters than could be achieved by a ratio-based approach, and would reduce cumulative impacts to wetlands within San Diego more effectively than alternative mitigation. Although this approach would more effectively reduce cumulative impacts to wetlands along the coast, the project would continue to result in a cumulatively considerable contribution to impacts to wetlands and other waters.